

Our World Is Our Treasure



Environmental Education Manual

I. Table of Contents

I. <u>TABLE OF CONTENTS</u>	2
II. <u>WELCOME TEACHERS!</u>	4
INTRODUCTION	5
WHAT IS ENVIRONMENTAL EDUCATION AND HOW CAN IT HELP?	7
TIPS FOR TEACHERS!	9
ACKNOWLEDGEMENTS	10
III. <u>THE IMPACT OF OUR SURROUNDINGS</u>	11
THE ENVIRONMENT – WHAT IS IT ANYWAY?	12
WORDBANK	14
CONNECTIONS	15
WE CAN THANK THE ENVIRONMENT	18
THE GREAT FISH DILEMMA	21
IV. <u>VALUES ON THE LINE</u>	23
HARMFUL BEHAVIORS	24
ENVIRONMENTAL DEBATE	27
WHAT WOULD YOU DO?	29
WE BUILT THIS CITY	33
V. <u>OUR WORLD AROUND US</u>	35
NOT JUST A HOME	36
SCHOOL YARD ECOSYSTEMS	39
AN ISLAND HOME	41
BOTTLE HABITAT	44
RAIN FOREST EROSION	46
MACHO MOUNTAIN BUILDING	48
VI. <u>CHANGING ENVIRONMENTAL HABITS</u>	51
PROJECT: CLEAN UP	52
WATER POLLUTION	54
ENVIRONMENTAL FAIR ON RECYCLING	56
MAKING PAPER	58
THE TRASH WE PASS	60
SPEAK UP FOR RECYCLING	62
VII. <u>RENEWABLE OR NOT</u>	65
ALL WRAPPED UP	66
IF A TREE FALLS IN THE FOREST	68
ENERGY CONSERVATION	70
VIII. <u>DIFFERENT SPECIES, DIFFERENT REGIONS, DIFFERENT IDEAS</u>	72

ENVIRONMENTAL ISSUES IN THE POLAR REGIONS	73
WHY ARE SPECIES ENDANGERED?	75
ECHOLOCATION	80
IMAGES OF BATS	82
SHADES OF MEANING	85
<u>IX. REVIEW OF THE ENVIRONMENT</u>	<u>87</u>
ENVIRONMENTAL JEOPARDY	88
SAMPLE QUESTIONS FOR THE TEACHER	90
<u>X. BRINGING IT ALL TOGETHER FOR THE TEACHER</u>	<u>95</u>
ENVIRONMENTAL SUGGESTIONS: THROUGHOUT THE SCHOOL YEAR	96
ENVIRONMENTAL SCAVENGER HUNT	99
HOW TO ORGANIZE YOUR OWN CLEANUP	100
ALTERNATE ENVIRONMENTAL ACTIVITIES	101
ENVIRONMENTAL DICTIONARY	104
MATERIAL LISTS	106
HELPFUL SOURCES FOR ENVIRONMENTAL EDUCATION	107
MODEL LETTER TO THE PARENTS	108
INDEX OF LESSONS	109
EVALUATION OF 'OUR WORLD IS OUR TREASURE'	110

II. Welcome Teachers!



*'By learning you will teach; by teaching you
will learn.'*

– Latin Proverb

Introduction

Why the focus on environmental education? At present, more than 5.3 billion people are using (and often knowingly or unknowingly abusing) the earth's natural resources. In every corner of the world people are cutting forests, extracting minerals and energy supplies, eroding topsoil, polluting air and water, creating hazardous waste, and disrupting natural areas at a rate unprecedented in the history of life on earth. As pressures from overpopulation and development increase, it is becoming increasingly difficult for people to provide for their needs and wants. It is also becoming impossible to escape the consequence of severe environmental degradation: species extinction, spreading deserts, contamination from pesticides, increasing public health problems, starvation, poverty, and loss of human life. Many experts fear that if the current rate of destruction continues, we will see the gradual breakdown of the very systems that support life on earth.

The process of environmental education aims at improving the quality of life by empowering people with the tools they need to solve and prevent environmental problems. Environmental education can help people gain knowledge; skills, motivation, values, and commitment they will need to manage the earth's resources with sustainability and to take responsibility for maintaining environmental quality.

Our goal in writing this manual is to help educators working in schools throughout Romania to develop strategies for creating effective environmental education programs. Whether you work with secondary students in rural or urban areas, or at teacher training institutes you can incorporate environmental education into your lessons. Contrary to what people think, environmental education is not tied solely to the science curriculum. It cuts across all subject areas, including geography, language arts, history, social studies, economics, and the humanities. Although this manual focuses on school-based environmental education, much of information applies to non-formal and community-based education programs as well.

Children are important audiences for environmental education because they are tomorrow's leaders and resource users. In some cases children can influence parents and other community members. Educators who work in schools and other educational institutions can have a tremendous impact, from increasing awareness and knowledge to helping form attitudes and facilitating action projects on behalf of the environment.

As you can see from the table of contents, this manual focuses on a variety of topics relating to successful environmental education efforts including different teaching strategies, activity development for the classroom and activities for Romanian schools to become ecological schools. The activities take an interactive, student-centered approach, which provides opportunities for students to work together in pairs, small groups, or teams, pooling their knowledge and learning from one another. Students work together, exchanging information, discussing real issues, solving problems, or performing other specific tasks. In all of this, the educator functions as a facilitator, guiding the class through activities and encouraging students to discover and learn about environmental issues on their own. Underlying the approach is the conviction that students learn to communicate better if they are presented with stimulating classroom activities in which they are personally involved. Each activity is presented in the form of a lesson plan. These few examples represent merely a sample from a wide range of possibilities for introducing the study of the environment in the classroom. Imaginative teachers will come up with many other ideas on how to approach the subject of various environmental themes to stimulate their students. But we do not tell you what to teach in this manual. Instead, we hope to provide you with information and ideas to help you develop the most appropriate programs to your school in Romania.

We encourage you to use this book as a starting point to help you structure a program that works best for you, and to adapt the activities and strategies suggested here to fit your needs. In the back of the manual there is an index that shows all the different types of lessons that ‘Our World is Our Treasure’ has. Use the index to help you figure what lessons are appropriate for your classroom.

We would greatly appreciate feedback from you. Please let us know how we can improve this manual and what successes and setbacks you have had in implementing environmental education programs. Evaluation forms are found in the back of the manual along with the contact information to give feedback too.

Finally, we think it is important to mention the biases that we bring to this manual. We feel environmental problems are urgent and must be addressed by the global community and that education needs to be an integral part of the solution. Conflicting opinions about the state of the environment, the consequences of environmental degradation, and the role of education make good subjects for discussion and debate and ultimately can form the foundation for stable change. We feel that environmental education should not ‘brainwash’ people into thinking a certain way: our hope is that it can help people learn how to think –how to solve problems, make decisions, weigh options, and align values with personal actions.

As an educator, you possess the power to change lives and serve as role models for your colleagues and other educators. We wish you much success and look forward to hearing from you. (Environmental Education in the Schools: Creating a Program that Works! pages 1-3).



What is Environmental Education and How Can it Help?

The goals of environmental education efforts around the world are similar – to maintain and improve environmental quality and to prevent future environmental problems. In part, environmental education is information education, increasing student knowledge about the environment. Students learn about global warming, solid waste and other environmental problems; they learn about ecology and how the world ‘works’; they learn about the consequences of environmental degradation; and they learn about their role in creating and preventing environmental problems.

Environmental education increases awareness about issues and develops an understanding of personal values by digging into attitudes and beliefs and by helping students evaluate and clarify their feelings regarding the environment and how they contribute to environmental problems. It helps individuals understand that there are conflicting values and people and that these conflicts must be addressed to ultimately prevent and solve environmental problems. Environmental education contains practical elements that children can learn like: how to plant a tree, how to apply pesticides carefully, and how to plant crops which can lessen environmental damage.

Environmental education aims at developing awareness and concern regarding all aspects of the environment and problems that concern it. It seeks to build the knowledge, skills, attitudes, motivation, and commitment needed to solve current problems and prevent new ones. Specifically, environmental education stresses developing these five characteristics within individuals of the global community:

Awareness: Help students acquire an awareness and sensitivity to the total environment and its problems; develop the ability to perceive and discriminate among stimuli; process, refine, and extend these perceptions; and use this new ability in a variety of contexts.

Knowledge: Help students acquire a basic understanding of how the environment functions; how people interact with the environment; how issues and problems dealing with the environment arise, and how they can be resolved.

Attitudes: Help students acquire a set of values and feelings of concern (reverse order there) for the environment as well as the motivation and commitment to participate in environmental maintenance and improvement.

Skills: Help students acquire the skills needed to identify, investigate, and to contribute the resolution of environmental problems.

Many people argue that students around the world, especially in urban areas, are losing touch with the natural world. In many places, outdoor experiences are not a regular part of instruction; instead of occurring throughout a student’s schooling, outdoor experiences are often limited to a few outings in primary grades. Getting students out into the environment on a regular basis is an important part of the comprehensive environmental education program. Nothing can replace first-hand experiences to help students understand their community, natural systems, and environmental issues.

Using the environment as a classroom is a way to bring your students closer to nature. Getting students into the community to look at the natural environment can make environmental education programs more relevant to the lives of students. As you focus on real systems,

problems, and solutions, your students get first hand experiences that are often missing in educational programs. These real experiences not only enrich the curriculum, but also help strengthen the ties between your educational program and the community.

It is important to be sensitive to the realities of the environmental problems facing your community. Many students and their families may be directly or indirectly responsible for the environmental problems that Romania faces. For example, many of your student's parents will probably work in factories that are polluting the air and water. Although you should not shy away from discussing environmental problems because of this, you need to be sensitive to 'laying blame' and think about the best way to present certain issues.

One of the main goals of environmental education is to help students develop the ability to think critically and creatively. A student who might someday become part of a local governing council will be most effective if he or she can successfully weigh options, identify alternatives, communicate, ask the right questions, analyze input, and make (solid, balanced, fair, etc) decisions. The same holds true for a student who might someday be a landowner trying to decide how to manage his or her land, or a citizen asked to take sides on an issue that affects the environment and the community. In any case, solid analytical skills will improve students' futures and the impact they have around them.

Environmental education is inextricably linked to values. As children mature, the value system they develop influences the decisions they make regarding all aspects of their lives, including environmental issues. Values add consistency to a person's life, thus helping to build a better self-concept.

An environmental education program can empower students' ability to improve the quality of their lives and the lives of others. This empowerment can lead to increased feelings of pride and self-respect. When students take part in community projects to help improve the environmental quality or solve a community problem, they are helping themselves and helping others at the same time. They are also affirming their values and seeing their actions can make a difference.

As an educator, you can have a lifelong impact on your students by incorporating environmental education strategies into your teaching. Environmental quality is directly relevant to the lives of your students and their families. By helping they know their rights as citizens, by empowering them to take action and feel they can make a difference and by getting them excited about the natural world, you can spark a personal ownership in environmental concerns. You can light the spark to start great changes in the lives of your students!



Tips for Teachers!

1. **Take It Outside** – All of these lessons are written for the classroom. However, it is also possible to teach, any and all, of the lessons outside. Bringing the class outdoors adds to the fun and excitement of learning about the environment. It also provides students to get out and see what they are learning about first hand, as well as serving as a great motivator.
2. **Adapt The Lesson** – Do not be afraid to modify the lessons to your particular teaching style. The lessons can be shortened or lengthened. You can add more information, stories or other appropriate materials to enhance the quality of the lessons. Be creative and enjoy yourself!
3. **Add Follow-up Activities**- There are many other activities that you, as a teacher, can do as a follow up to the lessons. There are examples for most of the lessons. Use your own ideas or search the Internet: there are hundreds of resources at your fingertips. It would be very beneficial to reinforce the ideas of this manual with follow-up activities.



Acknowledgements

I would like to thank the following organizations that helped put together 'Our World is Our Treasure'. *Peace Corps Romania*, for the funding and the information for this entire manual. *The Transylvanian Carpathian Society – Satu Mare* for collaborating with me to set up this manual. Without these organizations this manual would not have been possible.

A special thanks goes out to the following people who helped with all aspects of putting together this manual. I would like to thank everyone who contributed to this manual. To Ildikó Jankó Szép for the Hungarian translation and Noémi Szállassy for the Romanian translation of the entire manual. Heather Driscoll and Karen Brack for their input and English editing of this manual. For Abigél Szodoray-Parádi, Farkas Szodoray-Parádi and János Márk-Nagy for printing, editing and setting up the distribution of 'Our World is Our Treasure'. To Kris Vagos and Retezat National Park for their work on 'The Green Leaves Grew' which gave me ideas on how to put together a manual on Ecological Education. To Tricotex Kindergarten for letting me use their computer and Internet to get ideas to share with educators throughout Romania. Trent Ruder for your help with the final editing, support and friendship that helped me get through the final part of this manual. Manuela Lapadat for pushing me to develop a manual that educators can use here in Romania. And lastly, to my mom and dad, thanks for your support and love throughout my experience here in Romania.

Jeanna Wersebe
Manual Creator
Peace Corps Volunteer
Romania 2003-2005

III. The Impact of Our Surroundings



'The most important task, if we are to save the world is to educate.'

-Peter Scott

The Environment – What is it Anyway?

Objectives: Students will define 'environment' and identify the importance it plays in our lives.

Grade Level: IV to VIII form

Length of Activity: 50-55 minutes

Materials: Drawing materials such as markers, colored pencils, tape, and paper, chalkboard and chalk. Large drawing paper may work best for drawing activity but regular-sized sheets of paper are fine.

Source: And the Green Leaves Grew

Subject: Learning About the Environment

Introduction:

The **environment** can be defined as 'anything around us', both living and not living. It is essential to all of us because without it we would not have our basic needs of food, shelter, water, and space. It is the air we breathe, the sun which gives us warmth, the food and water nourishing our bodies, the roof over our heads, the plants and animals, rocks and streams, oceans and mountains, distant lands, all that is seen, felt, smelled, heard, and tasted. It is our survival and without it we would not exist.

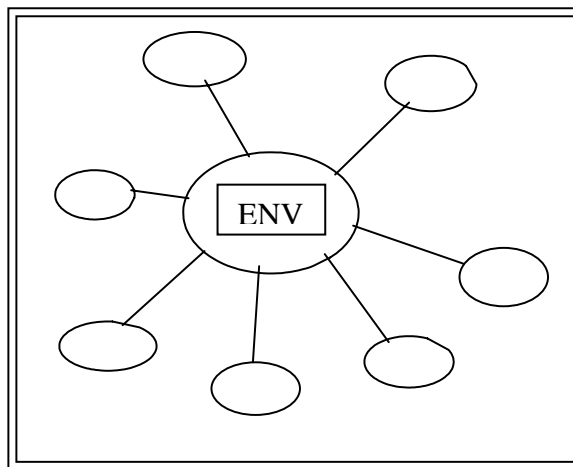
This lesson serves as an introduction to the environment in the classroom. The students will begin to think about the definition of 'environment', as well as, the importance of the environment to us all.

Procedure:

1. Ask the students if they have ever heard of the word 'environment'. If so, how was the word used? Who said it? Where did they hear it? Try to get enough information from the students to form a definition, but do not define the word yet.
2. Separate the students into groups, four or five in each group.
3. In their groups, have the students define 'environment' using the information from the classroom discussion that just occurred. Give them 5 minutes maximum for this part of the activity or when they are ready.
4. Have each group pick a representative to tell the class what their definition of 'environment' is and write all the definitions on the board. Given the students definitions, you should be able to come up with a similar definition as identified above: 'anything around us'.
5. After defining 'environment', have the students continue to work in their groups. Tell the students that they will now play a game. Each group represents a team. Assign numbers to each team, unless you feel that the students should come up with their own team names. Keep in mind that this may take longer.
6. Each group must create a list of things that are in the environment. The list can be quite extensive because the term is defined as: 'everything around us'. Give the students 10 minutes to make the list with their teams. While the students are thinking of their lists, divide up the chalkboard into as many sections as there are teams.
7. After the 10 minutes have passed, have everyone stop writing and one member of each group go up to the chalkboard and write down all the team's answers.
8. When the students are done writing their answers, go over the lists with all the students. Cross-out items on each teams list that are mentioned on the other team's lists. The determined winner is the team that has the most words in their list that no other team has. One point is rewarded to each word. Count all the points per team and announce the winner.
9. Draw a circle on the board and write the word 'environment' in it, and the definition of the word. Around the environment circle, draw smaller circles with each of the items that the students listed in the game activity. Connect the smaller circles with the environment circle using a line (see figure 1). If there are too many items, just choose an appropriate amount as

- examples.
10. Using this diagram, have the students give a reason why each of the smaller circles are important. Write the reason outside the smaller circles and connect it using a line.
 11. Give each group a large piece of poster paper or several smaller pieces that they can tape together, if larger pieces are unavailable.
 12. Have each group draw a picture that represents the diagram on the board for the environment, or items in the environment and/or the importance of the environment. Give the groups 20 minutes to work on the poster and perhaps more time later to finish the poster.
 13. After all the groups are done, have one member from each group talk about the group's picture that is a representation of the environment, explaining it to the class.
 14. Hang the posters up to form an environmental art gallery in the classroom.

Figure 1



Wordbank

Objectives: Students will gather and/or brainstorm ideas using the term 'environment'. The students will create a word bank to build their vocabulary on the issues and ideas surrounding the word 'environment'. This activity is to go on continuously through the year as the students learn more about the environment.

Grade Level: IV to VIII form

Length of Activity: Throughout the school year

Materials: Large piece of paper to be displayed in the front of the class, writing utensils and a large marker.

Subject: Learning About the Environment

Procedure:

1. In the beginning of the year explain to the students that they will be learning many new things about the environment.
2. Explain that as a class they will be thinking and learning about new words that are related to the whole concept of the 'environment'. Show the students the large piece of paper that the class as a whole will use to write down the words that they will learn about. Hang up the large piece of paper in the front of the classroom where all the pupils could see it.
3. Every time the students have a lesson about the environment tell them that they should think of the words that they would put on the large piece of paper that they learned in that lesson. Any new words that the students encounter and do not know should go on the paper too.
4. Students can keep their own word bank in their notebooks if there is not a large piece of paper available.

Further Assessment:

The words that the students gather can be used for tests and quizzes. Towards the end of the year when many words have been gathered, have students pick one word to do a report on. For example if one of the words is 'recycle' then the student can do a report on how recycling has changed the habits of the town and how it is leading to a greener future. Have the students pick their word and then have them choose to write their report on one of the many things that are related to the word. Worksheet activities such as word searches and cross word puzzles can be designed by the teacher to assist the students in learning the new words gathered during the lessons. Students can also make up songs, raps and poems from the word bank too.



Connections

Objective: Students will identify the connection between living things and our own necessities of life.

Grade Level: IV to VIII form

Length of Activity: 55 minutes

Materials: Drawing materials, scrap paper or regular-sized paper, poster-sized paper or four smaller pieces taped together, large space to hold activity.

Source: And the Green Leaves Grew

Subject: Web of Life

Introduction:

How are we connected to the rest of life on this planet? Every time we take a breath, we have made a connection with the trees; they make oxygen for us to inhale. When we drink a glass of milk, we are connected to the cows and the grass needed to make that glass of milk. There are many ways in which we are connected to the plants and animals around us. Most of the time we do not think of these connections. Sometimes they are hard to see. However, it is important for us to realize that we need other living beings to survive; these connections are essential to life.

In this lesson the students will identify the connections between living things and our own necessities of life. They will work in pairs and groups to list how the food we eat and the places we live are connected to other plants and animals. After discovering these connections, they will create a drawing of all the connections that they have discovered. Then they will participate in an activity demonstrating these connections.

Procedure:

1. As a class, discuss what all human beings need in order to live: water, oxygen, and shelter (a place to live). Briefly talk about where water and air come from; water naturally occurs on earth and oxygen is in the air and also comes from plants.
2. Have students work in pairs (if number is uneven – one group will have three). Assign each pair either 'food' or 'shelter'. In their pairs they must make a list of 'connections' involved in the subject they were assigned. They have to think about what they eat or where they live and figure out how those things are linked with plants and animals. For example, if they drink milk – they would write 'milk'-'cow'-'grass'.
3. Join a 'shelter' group with a 'food' group and allow the students (4-5 in a group now) to share their information from the previous pair discussion. (5 minutes)
4. If teaching this lesson to younger students, give each group a piece of large poster paper or 4 pieces of smaller paper taped together. Have the groups create a picture of all their connections. For example, a cow chewing grass under a tree which is making oxygen for the cow and the person who is in her wooden house (the wood was provided by the trees) drinking the milk from the cow and so on. Later, hang the pictures on the classroom walls.
5. For all ages, tell the students they are now going to play a game. Clear a big enough space for the activity. This game will show that sometimes the environment appears to be very chaotic and has no order. However, it can be looked at differently with a little 'twisting and turning' of their minds.
6. Give each student a 'nameplate' from Figure 2, found on the next page. Each nameplate has a type of plant or animal on it. If the class is studying a specific type of **ecosystem** at this time, you may want to create your own nameplates for that ecosystem.
7. Separate the students into groups of ten (or approx. ten); the group **MUST** have an even number of students. The teacher should participate if the number is not even. Have the groups stand close in a circle together. There will probably be two or three big circles depending on how many students are in the class.

8. Now it is time to start making connections. One of the students starts the game by saying what animal or plant he or she represents, and then has to make a gesture or sound that the animal makes. Looking around the circle the student reaches his/her right hand into the center of the circle and takes the right hand of another student who represents something needed to survive for the first student or something that depends on what the first student represents. The student then explains their decision on why he or she chooses that particular pairing. For example, if the student is 'grass', that student can hold hands with the 'cow' or a 'worm'. The grass needs the worm to put air in the soil for better growth and the cow needs the grass for food. Each time a connection is made, the student should say out loud what it is. Each person makes a connection with another until everyone has another person's right hand. Then the process is repeated, everyone makes a new connection to a different person with his or her left hand. Once this step is complete, all persons should be holding the hands of two different people and have their arms crossing everyone else's in the center of the circle.
9. Tell the students to look at the tangle they have made by connecting hands: it is the connection knot. It should, indeed, appear to be tangled. Without letting go of each other's hands the students must untangle themselves to form a circle again. Warn them not to hurt themselves, but tell them it can be done if they all work together.
10. Once back in a circle form, have the students observe again their situation (some students may have to face outside the circle due to the tangling). This is the circle of connections they made out of tangled knot. Tell the students that sometimes it is hard to see the connections we make each and every day. However, if one is aware of the connections they become very clear and almost simple.



PLANT/ANIMAL NAMEPLATES

Figure 2:

Wolf	Tree
Rabbit	Human Being
Grain	Cow
Grass	Bird
Worm	Insect

We Can Thank the Environment

Objective: Students identify the importance of the resources from the environment in making their favorite objects.

Grade Level: IV to VIII form

Length of Activity: 50 to 55 minutes

Materials: Several copies of the material list (Figure 3) for students to share (if copying is not an option the list can be written on the board for all students to see), drawing materials, scrap paper and space for the students to spread out.

Source: And the Green Leaves Grew

Subject: Natural Resources

Introduction:

Everything that we have comes from the environment's resources. We would not be able to listen to recorded music or even play music without taking something from the environment to make the CDs and instruments. We would not be able to use the Internet or chat with friends on the telephone. We would not have homes, drive cars, wear clothing, or have any of the gadgets and gizmos we are so accustomed to having without the resources we take from the environment.

In this lesson, students will learn more about what environmental resources went into making their favorite objects. They will play a game to discover another student's favorite item, and then inform the other students in the class about what their partner has chosen as a favorite thing.

Procedure:

1. Have each student think about his or her favorite object. It cannot be living. Tell them not to tell anyone because it needs to be a secret to play the game that they will play later.
2. Students should spread out all over the room so they can work without anyone else seeing their objects, which they will draw on a sheet of paper. They can build little barriers out of books if necessary to allow for more privacy while drawing.
3. Now have the children draw their favorite object on the sheet of paper. They can color the object. Students must make a list of 'materials from which the object was made'. (15 minutes)
4. Using a copy of the material list from Figure 3, have the students write what other resources from the environment were used to make their object. (10 minutes)
5. Pair the students. Try to put students who were far apart from each other during the first part of the activity together. The students' favorite objects must be a secret because the goal of the game is to guess the other person's favorite thing.
6. The aim of the game is to guess the other student's favorite object by asking about what environmental resources were needed to make it, then discovering the materials, the parts of the objects, and finally the object itself. The student who is guessing can ask twenty yes or no questions about what the object is made of, requiring the use of the materials list again. The guessing student can ask things like, 'is the object made from trees?' Then the other student will answer 'yes or no.' Depending on their partner's answer, the guessing student will now know a bit about the object.
7. Students can ask 20 questions, and can only guess what the object is once. If they guess and it is wrong the game is over. If they guess correct, they win the game. Each student gets a turn being the guesser. The students' favorite objects are only revealed after the other student has used up all 20 questions and has made their one guess to the identity of the object.
8. After all the students are finished playing the game, they introduce their game partner's

favorite object to the class, telling the class what the object is made from and what environmental resources were used to make it.

9. Have the students write a thank you to the Earth for their favorite objects together as whole on the blackboard for the whole class to see. The students can make their own card too, if time allows. Taking a sheet of paper and folding the paper in half, the students can draw on the front and write their own Thank You message.



Figure 3:

Materials List

<p style="text-align: center;">The Materials Out of Which your Favorite Thing Could be Made</p>	<p style="text-align: center;">Where the Materials Come from in the Environment</p>
<p style="text-align: center;">Plastic</p>	<p>Comes from Petroleum and Natural Gas – petroleum and natural gas are found in the ground – it takes the earth millions of years to make petroleum and natural gas – they are made when plants and animals break down (decompose) – in order to get to the to the petroleum and natural gas, drills are used to dig deep holes through the dirt and rock</p>
<p>Metal – this includes aluminum, gold, silver, bronze, brass, iron, copper, zinc, and more</p>	<p>Metals are found in the ground and are dug out of the dirt and rock</p>
<p style="text-align: center;">Glass</p>	<p>Glass is made from a certain type of sand called silica sand which is found in the ground – this sand is combined with two other things that are found in the ground – limestone and soda ash – these three things are combined and heated up which makes the glass</p>
<p style="text-align: center;">Polyester/Nylon</p>	<p>Comes from Petroleum and Natural Gas – petroleum and natural gas are found in the ground – it takes the earth millions of years to make petroleum and natural gas – they are made when plants and animals break down (decompose) – in order to get to the to the petroleum and natural gas, drills are used to dig deep holes through the dirt and rock</p>
<p style="text-align: center;"> Cotton Wool Leather Silk Paper Wood </p>	<p style="text-align: center;"> Cotton Plant Sheep’s fur Cow’s skin Silk Worms Trees Trees </p>

The Great Fish Dilemma

Objectives: To have students demonstrate how increased population places a strain on natural resources. To have students describe the outcome of a self-interest strategy for managing renewable resources and have them explain how limiting the use of our resources can help to prevent us from exceeding the carrying capacity of the earth.

Grade Level: IV to VIII form

Length of Activity: 50 to 55 minutes

Materials: 2 kilograms of crackers or some other small object that the students can handle easily and one large bowl for every four students. For every four students there should be one bowl and 16 crackers, which will make the math easier.

Source: Environmental Education in the Schools: Creating a Program that Works!

Subject: Natural Resources

Introduction:

Is there a commons dilemma to be resolved in your community? A **commons** is any publicly owned or shared resource, such as a forest preserve, an aquatic area, or the air we breathe. A dilemma results when population growth places pressure on the commons through overuse or misuse of a resource, causing the resource to become threatened or damaged. For instance, as population in an area grows, the addition of each car creates more air pollution, and the air quality for everyone declines. More people, means more public use of parks which often results in overuse of trails, more litter, and more pollution of waterways.

This lesson serves as a gateway for students to learn about natural resources and how a cooperative strategy needs to be employed by everyone if resources are to be conserved for future use. Students will play a game first to better understand what a cooperative strategy is and then discuss what precautions should be taken by a community to use natural resources in a sustainable manner and ensure their availability in the future.

Procedure:

1. Explain to the students that they will be playing a game and introduce the ground rules, supplying only the information needed to get the students started:
2. The object of the game is to harvest as many fish as possible from the sea but to have enough fish to be able to harvest in the future. Students will simply pick the fish out with their hands to 'harvest' them.
3. At carrying capacity, there are 16 fish (crackers) in the sea (bowl). For every four fish each student harvests, he/she will receive one point. The more fish you harvest, the more points you will receive.
4. The group will have four, twenty-second trials in which to harvest fish. The teacher will notify every group when to start and stop each trial.
5. If fish remain in the sea after each trial, a new fish will be added for each remaining one. If there are four fish left, four more will be added. But for each new trial, the total number of fish in the sea cannot be more than the carrying capacity of 16 fish.
6. For every fish a group has over the limit of 16, they lose 1 point because they went over the full capacity of the sea.
7. Teachers can add additional rules to make the game more interesting and realistic: each person needs at least 1 fish to live for each 20-second session.
8. Another option is to add the rule that the group will get up 1 point for every fish that remains in their bowl at the end of the 4 sessions. This will encourage them to keep a 'healthy' population in the bowl instead of having only a few or no fish remaining when the game is done.
9. There can be more than four sessions to allow students more chances to strategize.

10. Divide the classroom into groups of four, keep the groups as even as possible. Give each group a bowl of 16 'fish'.
11. Conduct the twenty-second sessions and record all results on the board. Give points to the teams who have kept the right amount of fish and take away points to the groups who went over the maximum capacity.
12. After the scores have been taken down, have the students clean up and go back to their seats.
13. Once students are settled start-asking questions such as: What was the maximum number of points achieved by a group? Why were fish only replaced if some remained in the bowl after each trail? (Gets the idea to students if all the fish are harvested then no additional fish will be born.)
14. Other questions to get students to answer are: What happens when members of a group do not use a cooperative strategy? What was the best strategy for harvesting the fish from the sea? (Eight from each trial is the number). **Stewardship** of a resource is demonstrated when we use a cooperative strategy that shows concern for a resource.
15. Write down on the chalkboard a list of some resources that a community needs to be responsible with so pollution does not occur. How will continued population growth affect our stewardship of the Earth's resources?
16. If students want to continue to learn about the subject approach them with the ideas in the section of further assessment of this lesson.

Further Assessment:

Have students select a local commons issue to investigate. Some dilemmas might revolve around the following situations: a decline in fish populations due to over harvesting; additional use of motorboats and other recreational equipment in a local aquatic area which results in greater noise and/or water pollution; or destruction of rails in a local park due to increased usage by the public. Both the teacher and student can make other possibilities.

Once students have identified a problem and collected data, they should determine which laws exist to protect the resource they are investigating. If there are no laws, try and have the students think of some solutions to try and solve the problems. The question of how to balance use with conservation of a resource is the central issue to a commons dilemma.



IV. Values on the Line



'We cannot change others, but when we change ourselves, we may end up changing the world.'

– Melodie Beattie

Harmful Behaviors

Objectives: Students will become aware of the harmful behaviors that effect the natural environment and to think of alternate activities to protect the environment.

Grade Level: IV to VI form

Length of Activity: 50 minutes

Materials: Drawing materials, scissors, glue, scrap paper, pencils and pictures from magazines if available but not necessary, and copies of the Harmful Activates worksheet (Figure 4) can also be written on the chalkboard.

Source: Educator's Reference Desk

Subject: Environmental Ethics

Introduction:

Everyday, people harm the environment through various activities from riding in a car, which creates gasses that affect the atmosphere, to littering. If the habits of people continue to harm the environment soon there will be no environment to enjoy. There will be no parks to sit in and talk to your friends, no lakes to enjoy swimming in or clean water to quench your thirst. The environment can change in accordance with the ability of people to change their habits.

In this lesson students will learn more about **harmful behaviors** that destroy the environment and will think of solutions to end the destructive practices that they might do in everyday life. They will draw and discuss alternative practices and share with the class their ideas and complete questions about changing the ways to protect their surroundings.

Procedure:

1. Place the students into groups of four or divide the class as evenly as possible (depending on the number of kids in the class). Have the students make a list of activities that people do that seem harmful to the native plants and animals of the environment.
2. Have each group pick a representative to tell the class what their activity list includes. Write the student's answers on the chalkboard so the whole class can view them.
3. On scrap paper have each group draw one of the harmful activities that was mentioned to the class. Each group should try and draw a separate activity, if possible. If magazines are available have the students cut out pictures of people engaged in activities harmful to the environment and paste them on the scrap paper.
4. When all groups are done with their drawings or cutouts, collect all the papers and redistribute the drawings so that each group gets another group's pictures.
5. Ask each group to analyze the drawing that they have received, directing them to discuss such things as, what is happening? Does it harm wildlife? How? Does it seem appropriate or inappropriate behavior? Why? Is the person doing it having fun? What are alternative forms of the same behavior that would be less impacting to the environment? Or any other questions that the teacher feels that needs to be addressed with the activity.
6. After the students have answered all the questions, have each group share with the rest of the class their answers to the questions, while displaying the picture and their possible recommendations for less harmful behaviors towards the environment.
7. Hang all the pictures on the wall to make an environmental gallery to remind the students of the harmful ways people behave towards the environment.
8. Have the groups separate and then pass out to each student a copy of the Harmful Activity sheet. If copying the activity sheet is not an option than write the questions on the board. Collect the student's answers at the end of the class session to be graded or to go over with the students in the next class session.

Further Assessment:

After the students have seen the multiple ways in which humans are harmful to the environment, students could create handbooks illustrating the harmful behaviors that effect the environment. Students can outline alternative ways that would be less harmful to the environment. Each student could make their own handbook to take home and share with their family and friends. Or the students can make posters of alternative behaviors and hang the posters around the school.

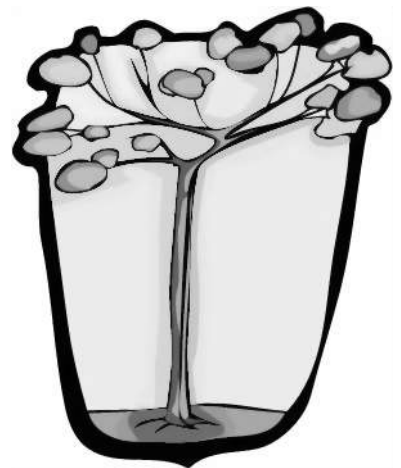


Figure 4:

Name: _____

Directions: Complete the following questions based on the **Environmentally Harmful Behaviors** we learned in class today.

1. Make a list of five things which people do that harm the environment:
2. For each of the five things listed above, write what you can do about it.
3. Make a list of ten things people can do to help the environment.
4. What are some ways to help/ educate people to change their harmful impacts on the environment?

Environmental Debate

Objective: Students will participate in debates on various environmental issues. The students will distinguish between facts and opinions.

Grade Level: IV to VIII form

Length of Activity: 55 minutes

Subject: Environmental Ethics

Introduction:

Garbage, garbage, garbage, what would you do with a pile of garbage? Every day people generate tons of garbage. Why so much garbage? Are we running out of places to put our garbage? These are just a few questions that come to mind when thinking of ideas surrounding garbage and where to put garbage.

In this lesson, students will learn of different ways of solving environmental issues that surround their everyday life. They will have a debate in a public forum style to discuss whether or not dumps are beneficial to inhabitants of the town.

Procedure:

1. Write the word 'debate' on the chalkboard and ask the students what this word means to them.
2. After the students reply with answers, tell the whole class that they will be participating in a debate about an environmental issue involving garbage.
3. Have the students debate on an important environmental issue that the town or county is facing with garbage. An example is: Should the town of Satu Mare install an area where people can dump their trash near the city, or in the city? There are so many subjects that the students can debate on. Feel free to think up of other topics that are relevant to the surrounding area with garbage.
4. One side argues that the town of Satu Mare should and another side says that Satu Mare should not install a dump next to the city.
5. Questions to ask the students before they are separated into groups are: Do you agree that the town of Satu Mare should or should not put the dump near the town? What are some other alternatives to the answer? Who will be affected the most? Is creating dumps an answer to the larger environmental problems Romania is facing regarding waste disposal? If the town does put the dump nearby what kinds of restrictions should be imposed? Do not have the students answer out loud because these are questions to get them thinking.
6. Have the students start brainstorming pros and cons of this debate. Write on the chalkboard all the ideas the pupils provide putting pro arguments on one side of the board and the con arguments on the other.
7. After the list has made, tell the students that a small group of students will be representing different people in the town. Assign students to be the mayor of the town, the executive of the development corporation who will be building the dump near the city, concerned citizens who will live near the proposed area, environmental scientists, recycling firms, and citizens who think that the dump will provide cleaner areas in the town and other **stakeholders** or any other persons that the students feel should be in the debate. Six people are usually enough. Other people who would be affected by the topic should be included, if not mentioned above. Examples are university groups, different types of concerned citizens, other environmental groups, have students use their imagination.
8. Have the volunteers sit up front in the classroom and explain to them that they will be taking on the identity of one of the particular stakeholders and that questions will be

directed to them for which they will need to think of logical answers, as if the debate was real.

9. Hold the debate in the public forum style where the audience (the rest of the class) asks questions, make comments and talk about problems that the community might face if the town constructs the dump. The audience can be citizens of the community who have come to talk about the issue concerning their town, they can have dialog back and forth, debate back and forth about the issues. Make each student who is in the audience ask at least one question or make at least one comment during the debate.
10. Have a vote at the end of class on whether to build the dump in Satu Mare or not.

Further Assessment:

Have the class debate on different environmental topics such as endangered species and how much should they be protected, should insecticides and pesticides be used on farms and their benefits and the list goes on. The students should research before they have the debate so they can provide information that they can use during the debate that will help them. After the debate contact the mayor's office and ask if the students can attend, one of the debates that the city is conducting. The students can see how issues are worked on in the city office and how decisions are made.

Another way that the students can show how they feel about the issues being debated is by having the students draw and design well-thought-out political cartoons to express their point of view. If the cartoons are good enough contact the local paper to have the cartoons printed to show the whole town what students think of the different environmental issues that the area faces.



What Would You Do?

Objectives: Students will discuss problems that reptiles and amphibians face while learning how to express personal feelings and beliefs that can affect the situations involving animals.

Grade Level: IV to VIII form

Length of Activity: 50 to 55 minutes

Materials: Scrap paper and writing utensils

Source: Environmental Education in the Schools: Creating a Program that Works!

Subject: Environmental Ethics

Introduction:

Amphibians as a group are often confused with reptiles, but they are their own distinct and separate group of animals that are considered cold blooded. Amphibians lay their eggs in water. When the eggs hatch the amphibians have gills like fish when they are first born and they get their oxygen from the water. As they grow most amphibians go through a metamorphosis or change and develop lungs and legs to live on land.

Unlike reptiles amphibians have smooth moist skin and many use this skin to aid in their breathing. Because of this many amphibians are susceptible to environmental changes and frequent handling. Reptiles are also cold blooded like amphibians. Most reptiles lay eggs, but unlike amphibians, reptile eggs are laid on land and reptiles have lungs from the very beginning. Reptiles are also covered with scales on their entire body.

In this discussion activity, students will explore how they feel about a variety of issues involving reptiles and amphibians, through a series of questions and scenarios given to the students.

Procedure:

1. Before the activity, make Xerox copies of the scenarios (Figure 5) for the students. If Xerox is unavailable, the scenarios can either be written on the board for students to copy or on individual pieces of paper. Other scenarios can be made up to help the students better understand reptiles and amphibians too.
2. Start the lesson by asking students what they know about amphibians and reptiles, the differences, pet care, laws involving amphibians and reptiles, the types of animals that fall under each category and anything else the students would like to add about the animals. List all the answers on the board. If students do not know a great deal about amphibians and reptiles help them out with examples:
 - Reptiles and amphibians are known as herps and a herpetologist is a scientist who studies both types of animals.
 - If you see a poisonous snake, herpetologists recommend that you back away quietly and do not try to confront it. Many people are bitten when they try to kill a snake.
 - Most snakes are not poisonous. (Less than 10% of all snakes have venom that is capable of harming people.
 - Herp pets need a lot of care. They need clean water, clean cages, the right amount of humidity, and a balanced diet. Many will not eat in captivity and some require difficult to obtain food. Herps also get a variety of diseases when held in captivity.
 - Many herps, such as turtles, carry diseases that can be transmitted to people. Some herps can also bite, and some are poisonous.
 - It is very difficult to raise most reptiles from eggs, unless you have special equipment to control the temperature and humidity.
 - Many scientists do not recommend touching herp eggs because it can harm the developing embryos. Handling some amphibian eggs can kill them because the

- protective jelly gets damaged.
- Many herp pets are very expensive.
 - Many herp pets are sold illegally. And many herps that are collected illegally for the pet trade die before they are even sold.
3. Explain that as a class they will be reading about a variety of situations that deal with reptiles and amphibians, and that they will have to decide what they would truly do if faced with the situation describe on the pieces of paper. Emphasize that there is no 'right' or 'wrong' answers in the activity. The purpose of the activity is to learn about certain issues involving herps, to explore how they feel about the issues, and to discuss their feelings and opinions with others to get different perspectives.
 4. Have a volunteer read one of the scenarios. Wait a few moments until everyone has decided on how he or she would deal with the situation, picking one or more options that most closely match how he or she would react. If none of the options apply, tell the students to think about what other actions they would take.
 5. After the students have had time to think about the situation, have them share their reactions. You might want to write the answers on the board and tally up the score. Repeat these steps for each scenario.
 6. Encourage a discussion and provide time for each person to discuss why he or she responded in a certain way. Ask the students what kinds of things they had in mind as they made their decisions. For example, did they choose what they thought were the most responsible actions to take? Did they need more information before they felt comfortable making a decision?
 7. Afterwards, ask if the group discussion helped provide new perspectives or if, after listening to other people's opinions, any of the group members had changed their mind about what they might do.

Another Option to the Lesson:

Depending on the make up of the class, you might want to try this activity using small discussion groups. Have one person in each group read a scenario to the other group member and record how each person would react to the scenario. Encourage the groups to discuss their answers by individually going to each group and helping with their discussion walking around. After about five minutes, have the groups move on to another scenario, and have another person in each group act as the reader and recorder. After all the groups have finished discussing each scenario, talk about each one with the entire class. This option will work easier if Xerox copies of the scenarios are available to the groups.

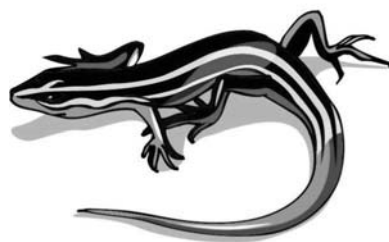


Figure 5:

What Would You Do?

1. Your best friend is about to go on vacation to a park in Southern Romania. She has been reading about the lizards found in the South and tells you she is going to try to catch a lizard while she is there. She tells you all about the habits of these lizards, such as what they eat, where they live, and how they defend themselves. She also explains how she is going to take care of it when she gets it home, showing you the book she checked out of the library on how to care for lizards.

What do you do?

- Encourage her to bring the lizard back so you can learn more about it too
 - Tell her that you do not think it is right to take an animal out of the wild to keep as a pet
 - Read more about lizards so you can help her take care of it
 - Ask her to bring you one, if she finds two
 - Tell her it is illegal to collect any living things in a park, but let her make up her own mind
 - Other
2. Ion and his sister find some leathery, white eggs buried in the leaves under a log. Ion thinks they might be snake eggs, but he is not sure. He has always wanted to have a pet snake, but the only pet he has ever had was a turtle.

What Should Ion Do?

- Collect the eggs and put them in a terrarium when he gets home
 - Leave the eggs where they are, but mark the spot so he can return to check on them often
 - Collect one of the eggs and take it home to try and hatch it
 - Collect the eggs and take them to the nature center near his house
 - Other
3. You are on a hike with your friends and older sister when your sister spots a viper. The snake is close to the trail, sunning itself on a rock. Your sister tells everyone to stay perfectly still. Then she picks up a large stick, slowly makes her way to the snake and kills it.

What Do You Think?

- Your sister was right to kill the rattlesnake because it was poisonous
 - Your sister should not have killed the snake because the snake was sunning itself; but the snake looked as if it might strike she would have been right to kill it
 - All of you should have tried to walk away without harming the snake
 - Your sister was right to kill the snake because it is OK to kill any snake if it gets too close to people
 - Other
4. You and your family visit a roadside zoo that advertised an exhibit featuring live snakes and other herps. After paying 10,000 lei a person to get inside, you see that the exhibits are falling apart and the reptiles are poorly cared for. Many of the animals have no water, and others are crammed together in tiny cages. In one of the cages, a dead snake is in the corner. And the turtle tank is filthy.

What Would You Do?

- Ask to see the owner and explain how upset you are about the conditions
 - Not say anything because you do not want to make the people that are working there feel bad
 - Ask for your money back and leave
 - Think about it and eventually call or write a letter to an animal protection organization or the local newspaper
 - Not say anything because the people who run the zoo know more about taking care of herps than you do
 - Other
5. While on vacation in a foreign country, your mother decides to buy a pair sunglasses with tortoise shell frames. You remember reading that many sea turtles are endangered. But you are not sure that these frames were made from endangered turtle.

What Would You Do?

- Ask your mother not to buy the glasses, just in case
 - Ask your mother not to buy the glasses, because you do not think it is right to make glasses from turtles whether they are endangered or not
 - Ask the salesperson if the frames are made from endangered turtle, and he or she says no, tell your mother that it is OK
 - Let your mother decide for herself what she should do
 - Other
6. Every year, thousands of garter snakes hibernate in caves in Manitoba's lake region in Canada. In spring, as the garter snakes emerge, collectors from all over North America stand outside the dens, waiting to capture them. The collectors sell the snakes to supply companies and pet stores. Over the years, the number of dens has decreased from 100 to 30 and scientists are worried that the snake populations are in trouble.

What Do You Think?

- It is OK to collect the snakes because many are being used in schools to educate people
 - It is OK to collect some snakes, but the number of snakes should be regulated
 - There should be laws to prohibit all snake collecting for profit
 - Other
7. Your next-door neighbor takes a trip to India and brings back presents for your family. She gives you a belt made from the skin of an Indian snake.

What Would You Do?

- Thank her but tell her you cannot accept the gift because you think the belt could have been made from an endangered snake
- Thank her and take the belt, even though it might have been from an endangered snake; later talk to her about products made from endangered animals so she is not likely to buy such a thing in the future.
- Get angry with her for buying a product made with snake skin, and tell her she should not have bought something if it even had a chance of coming from an endangered animal
- Thank her and wear the belt because you would be the only person with such a neat belt
- Other

We Built This City

Objectives: To make students more aware of the need to respect the environment, and its natural resources and to apply that knowledge and develop an 'ecologically sound' city.

Grade Level: VII to VIII form

Length of Activity: 50 minutes or two 50-minute sessions. Depending on how the teacher wants to divide up the class time.

Materials: Drawing materials and scrap paper

Source: Educator's Reference Desk

Subject: Environmental Reasoning

Introduction:

City planners have to think of the environment every time they make a sound decision about the city. They need to consider everything from how waste is disposed of to how people get light every time they flip the light switch on. If city planners did not place certain quality standards on the environment then there would be waste everywhere and everyone would be sick since their water and streets would not be clean. The environment has a huge impact on how people live in the cities and how the city planners manage the city.

Students will design and build a model of their **ecologically sound** city by using a master plan that they will create. Through group format and presentation they will share the model with the class and justify their master plan. Development of an ecologically sound plan can have a positive ecological effect upon the city and the students themselves because they will be living in a cleaner environment.

Procedure:

1. Together as a class discuss, what all cities need to have for their citizens to survive. To live in a city, the city needs things such as homes, heat source, electricity, waste disposal and etc.
2. Then have the students define what 'ecologically sound' means to them and to a city and have them apply what an ideal 'ecological city' might have for their citizens.
3. After discussion, divide the class into groups of four, or divide the class as evenly as possible.
4. Explain to the students that they will be designing an ideal 'ecologically sound' city with their group. Each group must design, draw, and explain certain aspects to the class their ideas on their city at the end of class or in another class period.
5. Each city must include:
 - Name of the city
 - Population of the city
 - Laws for the city to help make all citizens aware of their ecological responsibilities
 - One river that runs through or around the city
 - Some methods for waste disposal
 - Two productive industries
 - Homes for the population
 - Drawings of the power source for light, heat, and waste disposal
 - A bird's eye view of the 'ecological city' with a legend to define the city
 - Anything else that the teacher would like to include in the city that is important
6. After each group has designed their city. Have each group pick a representative to share with the class their 'ecologically sound' city to the rest of the class. Encourage the class to ask questions on why the student developers picked the things they did.

7. Hang up the drawings of the new cities in the classroom for all the students to be reminded of how important the environment is where city planning is concerned.

Further Assessment:

For students to gain further knowledge on city planning, arrange for field trips to water purification plants, waste disposal sites, and to other city planners or officials to discuss plans for the city and how the city itself includes the environment in their plans. Have students also find out, what kinds of people are involved in planning a city from the city planner, to the mayor to the building contractors.



V. Our World Around Us



'The universe is so successful, I simply want to learn its principles and apply them rather than to exploit it blindly and fear for survival.'

– R. Buckminster Fuller

Not Just a Home

Objectives: To have students be able to define 'habitat', its importance, and to be able to create a list of ways to protect habitats.

Grade Level: IV to VIII form

Length of Activity: 55 minutes

Materials: Copies of the chair cards (Figure 6), paper, large space in classroom, chairs, music source that can be turned on and off easily.

Source: And the Green Leaves Grew

Subject: Habitat Loss

Introduction:

A **habitat** gives us everything we need to survive: food, water, shelter, and space. Imagine being without any of these things. What would happen? Plants and animals all over the globe are experiencing this; they are losing their habitats due to negative changes in the environment many of these changes being caused by man. Habitat loss is the number one cause of species extinction. What can we do, to help?

In this lesson students will define the importance of a habitat to any species survival. They will participate in a 'musical chairs' type of activity, which will demonstrate the importance of a habitat to species survival. After playing the game students will engage in a group exercise to discuss what they learned in the game and produce a list of ten ways to protect species' habitats.

Procedure:

1. As a class discuss the word, 'habitat'. See if they can come up with a definition for the word. Start with the question, 'what is needed to live?' Then explain that all of these things are included in a habitat. The definition is: a place that supplies the species with everything that it needs to live. (Food, water, shelter, and space)
2. Now the students will play a game that is based on 'musical chairs'. Clear a space in the classroom big enough to fit two rows of chairs, back-to-back, one for each student. Place the food, water, shelter, and space cards (Figure 6) on each chair (have one for each chair). Use an equal number of each type of card depending on how many students are playing. Tell the students that the chairs represent their habitat. Each chair is something that is needed: food, shelter, water, and space.
3. When the music starts, the students walk around the chairs in a circle. When the music stops, they try to sit in a chair, only one person per chair.
4. Start the music. Let the students walk around the chairs for however long. Then stop the music.
5. Every student should have a chair in the first round. Explain that, at this time, all the students are able to live in the habitat; it provides enough for all of them to survive.
6. Introduce a change by reading it out loud from (Figure 7). Students who do not 'survive' can read aloud the changes. Take away the appropriate chair that is related. For example, if the change affects the food supply, take a food chair away.
7. Start and stop the music again. This time one student should be left standing since there aren't enough chairs; this student does not 'survive'. That student is out of the game and will be joined by others in later rounds.
8. In between each round, introduce a change and remove the corresponding chair. Rearrange the chairs as necessary so there are no gaps. Start and stop the music.
9. In between each round, introduce a change by reading it aloud and remove the corresponding chair. Students who do not 'survive' can read aloud the change. Start and stop the music. Have the students who do not 'survive' stand with the others. Once a few rounds have passed, talk to the students again about what is happening to their habitat.

10. Continue this game until one student is left. Now the game is over. Overall the game should take from 20 to 30 minutes depending on how long the music is played for and how many students there are.
11. Separate students into groups of four. Give each group a piece of scrap paper. In these groups, the students discuss what they learned from the game and make a list of ten ways to protect habitats from being destroyed.
12. Each group shares their list with the other students in the class.

NOTE:

The game was designed for twenty students. If the class is bigger, just repeat some of the changes in Figure 7, taking away the appropriate chair. Make sure you have copied enough chair cards to correspond to the changes you repeat; a water chair corresponds to a water change. If the class is smaller, make sure the cards placed on the chairs match the changes that are being read to the class. It will save time if the game is set up ahead of the class time, at least having the appropriate chair cards on each chair. Set up a source of music in the classroom, which can be turned off and on quickly, i.e. a radio, cassette, or CD player.

Figure 6:

CHAIR CARDS

FOOD	WATER
SHELTER	SPACE

Figure 7:

CHANGES

Water:

- People have been throwing their trash in to the river upstream. Certain animals and plants that live in the river cannot survive because of the pollution. Remove a water chair.
- People have dammed up the river to provide more electricity. The river no longer flows as freely or as much as it once did. Remove a water chair.
- The rain has turned into acid rain because of the coal burning factories to the west. The acid rain has raised the pH of the lakes and the soil. The water is still safe to drink, but

the fish and other plants and animals that live in the lake can no longer survive. Remove a water chair.

- Trees upstream have been removed by logging. The soil no longer has stability causing erosion. The river becomes filled with silt and mud that washes down stream. Many species cannot live in the silty water. Remove a water chair.
- A factory has spilled toxic waste into the river upstream. The water is not safe to drink. Remove a water chair.

Shelter:

- A big logging company came into the forest and clear-cut a large amount of trees, leaving a large open space where the forest used to be dense. Many of the animals that depended on the thick forest for cover will not survive. Remove a shelter chair.
- Some of the caves in the area have too many tourists and the bats can no longer use them to roost because of the disturbance. Remove a shelter chair.
- Developers who want to build new homes fill in the wetlands and swamps, leaving all the plants and animals that lived there without homes. Remove a shelter chair.
- Collectors of rare bird's nests have taken a majority of the birds' homes. Remove a shelter chair.
- Since the river has been dammed, plants that grew along the riverbed cannot withstand the dry soil. Remove a shelter chair.

Food:

- The fish have been dying from a toxin released into the river. The animals that depend on the fish for food are hungry. Remove a food chair.
- Wild mushrooms are a popular delicacy. People have taken most of the fungi out of the forest to be sold. Other animals in the forest depend on the mushrooms for food. Remove a food chair.
- The mosquitoes have all been killed with an insecticide (chemical). They may be pests to humans, but many rare birds, bats, frogs, and spiders depend on them for food. Remove a food chair.
- People have allowed their farm animals to overgraze meadow areas, changing the meadow areas into dry, sandy plains. Other animals depended on the meadows to be a home to field mice and other small animals that make good snacks. Remove a food chair.
- A lake is declared 'dead' because of the acid rain. Nothing can live in the lake. The food supply is gone. Remove a food chair.

Space:

- An area of land has been cleared for a strip mine. The animals from that area are homeless and go into other areas to find another home, crowding the animals already there. Remove a space chair.
- People who go on tours to see the wildlife in the forest travel through the area day after day, sometimes getting extremely close to the animals to take pictures and sometimes stepping on the plants. The loss of privacy is a loss of space. Remove a space chair.
- People who like to fish have introduced a species of fish to the lake. The new fish are much bigger than the native fish and taste better too, but they grow quicker and eat all the native species' food. The native fish can no longer have enough space. Remove a space chair.
- Farmland is needed. Trees are cut down to make fields for crops. The animals that once lived here lost some of their space. Remove a space chair.
- Wolves, bears, and other large carnivores need a lot of space. They no longer have enough because people are using the land on which they once lived. Remove a space chair.

School Yard Ecosystems

Objectives: To have students be able to classify animals and plants in their different families. To observe changes that occur in nature and to learn the complex interaction that takes place in nature throughout the year.

Grade Level: IV to VIII form

Length of Activity: Whole school year

Materials: Insect nets (made from panty hose and clothes hangers), plastic bags for collecting items, hand lens if available, glass jars and plant and animal guides from the library, scrap paper and drawing materials. Teachers will need to know how to classify plants and animals in their different families.

Subject: Ecosystems

Introduction:

There are many different kinds of **ecosystems** in the world. All of which play important roles providing species specific habitats. Tropical rain forests are home to half the world's plants and animals, and surprisingly, the Earth's deserts are also rich in biodiversity, second only to the tropical rain forests. Exploring the world opens one's mind and makes the Earth seem a bit smaller. Learn more about planet Earth and your surroundings by taking a trip to the ecosystem that you see everyday.

This lesson serves as a yearlong exercise for the students. This lesson will enhance students' knowledge of the local ecosystem that they live in everyday. Through classifying animals and plants, plant rubbings, insect gathering, and animal drawings and other various methods seen fit in the area, students will collect data throughout the year and to make their own conclusions about their environment.

Procedure:

1. Explain to the class that they will be completing a yearlong project that deals with the ecosystem around the school grounds. Go over the rules that will take place and will be stressed when outside.
 - Students can not and will not destroy any parts of nature
 - Students will gather plants, insects and anything else that is in their little ecosystem that they think is important and after they classify the subject they must put it back where they found it
 - Teams will be comprised of two people (depending on how much land is available, groups can be bigger or smaller) and each member has to record down information in a notebook about the ecosystem and compare it with their group mates
 - Items must be included in a field journal or notebook that will be handed in at the end of a year. (Students can design their own manual if they choose to or their observations can be recorded on separate sheets of paper but they are responsible for all their data and rubbings and how they choose to store their information)
 - Temperature, date of visit, what the student observes, rubbings of plants, drawings of insects and animals, the weather and time of visit must be included in the entry of that day, and anything else that the teacher or student feels is important
2. Go over with students on the different methods of collecting and gathering plants and animals before they go outside including: how insects can be gathered with insect nets and how to place them in jars carefully so they can be drawn and then released and how to draw and measure the other animals they might find. Show students how to make rubbings of plants and how not to damage the plant when making the rubbings, sometimes plants fall apart after rubbings are made, that is fine.

3. After the students understand how to record the animals and plants they see, explain to the students how scientists classify animals and plants into families. With the help of animal and plant guides from the library the students will be able to distinguish the different items that they will find in their ecosystem.
4. When students fully understand how to classify and gather animals and plants, take the class out to find and plot the land that they will be watching for the school year.
5. Take the students to an area that they pass everyday but that will not be affected by other school children. The plots do not have to be on the school grounds if there is a field near the school that might be better to take the students to, instead.
6. When students arrive to the chosen place, assign plots to each group. Try to keep the student's plots spaced out from each other but close enough that all students are within eyesight of the teacher.
7. Have an example plot and show the students how they will classify, gather and record their data from the example plot.
8. Let students go to their plot and have them start with their first entry about their plot.
9. Take the students to their plots at least every two months or when the weather is changing. Students should have enough entries to notice a difference in their plots over time and how the weather plays an important part in ecosystems. These observations are key for students to understand their ecosystem.
10. At the end of the school year have the students write a report on the different observations that they saw throughout the year and include in their report their rubbings of plants and drawings of animals.
11. Teachers should determine how their students should present their information to the students, such as reports, class presentations or other ways.

Further Assessment:

The data entries do not have to be hidden. Hang the drawings and rubbings in the classroom so that the students can think about their schoolyard ecosystems throughout the year. When the weather is nice, take the students to other areas in the town and/or on field trips in the woods, wetlands, farms and mountains to gather information on the other ecosystems so that they can see different types of ecosystems. During festivals have the students create a booth to show the townspeople the different types of ecosystems that are found throughout the town and display the student's rubbings and drawings with explanations for people to see.



An Island Home

Objective: To have students understand the effects that people have on their natural environment

Grade Level: IV to VIII form

Length of Activity: Two 55 minute sessions, depending on the level of sophistication in the student planning of their islands

Materials: Large drawing paper and drawing materials. Copies of the worksheet (Figure 8), the worksheet can be written on the board if Xerox copies are not an option.

Source: United States Geological Society

Subject: Ecosystems

Introduction:

Tropical rainforests are found close to the equator. Rainforests are very important ecosystems and are home to over half of the worlds plant and animal species; and of many different cultures too. Scientists say there may be unknown cures to be found in the tropical rain forests. Perhaps an unfound plant species holds the cures for cancer within its roots. Other ways the rain forest is useful is that it can provide recreation to vacationers. Without hurting the rain forest people travel from all over the world to see the wonders that the rain forest has. There are many ways for the rain forest to be protected and enjoyed and there are many businesses that can succeed while doing both.

In this lesson, students will act as owners and developers of a lush, 14 square kilometer Tropical Island. Groups of students will the select the forms and extent of development on their island by considering the benefits of the development and the risks their actions pose for the island and the planet.

Procedure:

1. Start off the class by saying: Congratulations! You have just been awarded ownership of a tropical island in recognition of your concern for the environment and your wisdom in management. As owners of this island, you have some responsibilities:
 - Create jobs for your fellow citizens, there is a native population living in thatch-roofed huts and subsisting on fish, fruit, and nuts.
 - Students must develop the island as a model environment for business and for natural habitats
 - The island is covered by virgin rain forest and is surrounded by well-developed coral reefs. Both of these types of ecological systems are in danger all over the world. The island is in the students care. Have them consider their actions.
 - Each team will present to the class their island and the choices they made for their island.
2. As a class, brainstorm the possible range of businesses that could be developed on a tropical island. A few suggestions to get the class started but they cannot use these examples for their island. Ex: Golf resort, Timber Company, and scuba diving resort, or other ideas that students have.
3. Discuss with the students ways the outcomes of the project can be presented. Use these ideas for possibilities: a scale map of the island, a physical map of the island using white drawing paper, a brochure of what the island has for tourists and with a map, advertisement of the island and the business on the island, and/or a group report about the island and efforts to protect the environment.
4. Form interest groups between 3 to 5 students on how they want to handle the project.

5. Once the groups are formed, discuss with the class the ideas behind rain forest destruction. What is the benefit? What are the immediate and long-term costs? Who pays? These questions are to get the groups thinking about ways to handle their island.
6. Once the students have discussed some characteristics of a rain forest and coral reefs, focus the student's thoughts on the business opportunities these environments offer and the risks associated with these enterprises in a fragile environment.
7. Once the students have discussed some characteristics of a rain forest and coral reefs, focus the student's thoughts on the business opportunities these environments offer and the risks associated with these enterprises in a fragile environment.
8. Explain that in order to complete the project, students will have to complete a worksheet. The worksheet on page 42 can be Xeroxed or written on the chalkboard for students to copy.
9. Have students complete the third column of the worksheet to explore the impacts of their businesses and to think of alternative solutions that their businesses will have. The chart can be used as a guideline for students in how to approach their businesses for their island.
10. After the teams complete the team report on the specific solutions that they propose to counter the risks presented by their development plans, the students can start working on presentations about their island.
11. After all teams are done, have each team give a presentation about their island to the class. The teacher can grade accordingly to how they see best.

Further Assessment:

This exercise can be done using other environments including wetlands, deserts, Polar Regions, and etc. Adjust the text of the story and project requirements according to what ecosystem is chosen.

Another ecosystem for students to create is a habitable environment on another planet. What unique equipment and risks would have to be considered for such a project? For example, what would it take to transform an area on the planet Mars to make it acceptable for human habitation? (Mars has no ocean and four times the land area of the Earth). Groups can also create a model of their island using recyclable materials.

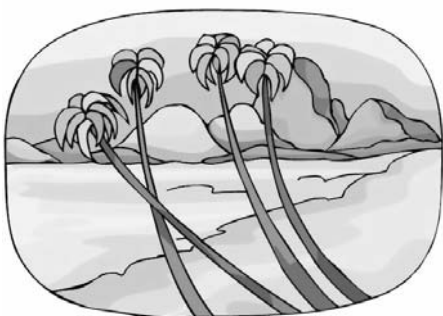


Figure 8:

<u>Considerations:</u>	<u>Risks:</u>	<u>Solutions:</u>
Clearing of Land	<ul style="list-style-type: none"> - Loss of habitats - Loss of ability of land to filter water - Increased impact of storms - Increased erosion with loss of topsoil and loss of water clarity - Extinction of species 	
Building of Roads	<ul style="list-style-type: none"> - Need for natural resources for building materials - Need for air conditioning and refrigeration, requiring power plants - Vulnerability to natural hazards 	
Water Supplies	<ul style="list-style-type: none"> - High Demand - Loss of quality - Intrusion of salt water and contaminants into groundwater aquifers 	
Electricity	<ul style="list-style-type: none"> - Need for power plants: coal, oil, and nuclear - Pollution from the burning of fossil fuels - Hazard from handling nuclear material 	
Automobile Traffic	<ul style="list-style-type: none"> -Air Pollution - Noise - Road Requirements 	
Solid and Liquid Waste Disposal	<ul style="list-style-type: none"> - Pollution - Space limitations 	
Marine Life	<ul style="list-style-type: none"> - Over fishing - Damage by people and boats - Death of coral - Need to import if fish populations decline 	
Shore and Land Plants and Animals	<ul style="list-style-type: none"> - Destruction of beaches - Introduction of nonnative species - Extinction of plant and animal species 	
Indigenous Culture	<ul style="list-style-type: none"> - Culture change - Changes in social relationships - Loss of traditions - Social unrest 	

Bottle Habitat

Objective: To have students become more aware of the components involved in an aquatic environment.

Grade Level: IV to VIII form

Length of Activity: Two 55-minute lessons for preparation and then a four-week observation period.

Materials: 2 two-liter bottles for each group, water source, light source, guppies, water snails, sand, scissors, graph paper, markers, and writing utensils. The students can bring in all these items. Items can be found at the local pet store.

Source: Fast Plants

Subject: Aquatic Ecosystems

Introduction:

Water is the largest part of the biosphere, covering nearly 75% of the Earth's surface. Aquatic regions house numerous species of plants and animals, both large and small. Without water, most life forms would be unable to sustain themselves and the Earth would be a barren, desert-like place. Although water temperatures can vary widely, aquatic areas tend to be more humid and the air temperature on the cooler side. The aquatic biome can be broken down into two basic regions, freshwater (i.e., ponds and rivers) and marine (i.e., oceans and estuaries).

Freshwater is defined as having a low salt concentration—usually less than 1%. Plants and animals in freshwater regions that are adjusted to the low salt content and would not be able to survive in areas of high salt concentration (i.e., ocean). There are different types of freshwater regions: ponds and lakes, streams and rivers, and wetlands. Marine regions cover about three-fourths of the Earth's surface and include oceans, coral reefs, and estuaries. Marine algae supply much of the world's oxygen supply and take in a huge amount of atmospheric carbon dioxide. The evaporation of the seawater provides rainwater for the land.

The largest of all the ecosystems, oceans are very large bodies of water that dominate the Earth's surface. Like ponds and lakes, the ocean regions are separated into separate zones: intertidal, pelagic, abyssal, and benthic. All four zones have a great diversity of species. Some say that the ocean contains the richest diversity of species even though it contains fewer species than there are on land.

In this lesson, students will construct a living aquatic ecosystem in a two-liter soda bottle. The stock organisms will be: water plants, snails, and fish. Students will record data concerning the observations they make over a four-week period.

Procedure:

Day One

1. Start off by breaking the class into groups of three or four, depending on the number of students in the class.
2. Explain that they are going to make their own aquatic ecosystems. Tell the students to bring in the materials that they need for the experiment. Teachers can have students bring in all materials or what they think is relevant.
3. Discuss the kinds of things that students are going to do with their aquatic ecosystems.
4. Over a four-week period, students are going to record daily observations in journals. Each member of the group is going to record their own data. Some things to watch out for are plant growth and population changes. Students will record what they see changes in population, plant growth, water quality, and animal growth.

- Quantitative measurements will take place. For example: Exactly how many? Exactly what size? How many days? A Qualitative measurement will also be taken into account: What color? What shape? Slow or quick movement?
 - At the end of the four-week observation period, students will graph their data on the graph paper in a way they can show the difference of their ecosystem from the beginning to the end.
 - Students will write a report at the end on what they observed. Specific questions should be answered in the report, such as: What would happen to your plant population if you added more snails? What environmental factors do you think influenced the growth of your fish/snails/plants?
5. What do you think would happen if the fish population doubled? Quadrupled?
 6. Students should also have a hypothesis to explain some of the thing that they witnessed.
 7. Each group at the end of the four-week period will collect all their data and their written reports and have a group presentation of their aquatic ecosystem and their observations.
 8. The items about the daily observations and the reports after the four-week period can be explained before or after the construction of their aquatic ecosystem.
 9. Discuss with the students about the definition of a 'habitat' and 'niche' and what the difference is between the two. Ask what they think our own habitat and niche are. Stress that a niche is much like an occupation, or the organism's role, while the habitat is its home.
 10. Talk about the five types of interactions that animals have with each other and the difference between the five. Predation, competition, parasitism, mutualism and commensalisms. This discussion will be relevant when students start observing their aquatic ecosystems. These types of questions can be asked before or after the construction of the ecosystems.

Day Two

1. Students will construct their aquatic ecosystems with the materials that their group or teacher brought in.
2. Have the students form into their groups and have the materials lain out.
3. Have one student cut the top of one bottle, at the shoulder where it tapers. Cut the base off another bottle and score it with holes. This is the cover.
4. Fill the bottom of the bottle with sand, 40 cm deep.
5. Add water—slowly, to minimize sand displacement—and then root three ten-centimeter elodea stalks (or any other water plant that is available) firmly in the sand. Sprinkle a small amount of duckweed onto the water's surface.
6. Let the aquarium stand overnight to let the sand settle, and to allow chlorine from water to dissipate if tap water is used.
7. The following day, add two guppies and snails.
8. Put all the bottles, which should be marked with some team name or the names of the students in a light source.
9. Have the students make their first observation, and continue to do so for the next four weeks.



Rain Forest Erosion

Objective: Students will construct a general scientific understanding about how plants hold soil in place via roots to help prevent soil erosion by water.

Grade Level: IV to VI form

Length of Activity: 55 minutes

Materials: a plastic bottle containing soil, a bucket of water, 2 graduated cylinders, 2 trays, and a 1m x 1m of grass growing in soil, ruler, paper towels, rubber bands, drawing materials, and 2 buckets. The students will use scrap paper and writing materials.

Source: Educator's Reference Desk

Subject: Erosion

Introduction:

What occurs when rain falls onto soil that contains no plants? Why does this happen? **Erosion** occurs when unprotected soil is washed away by rainfall. Plants prevent soil erosion by stabilizing the soil with their root systems. Rain forests are home to half of the world's plants but due to the rapid depletion of the rain forests, some areas are turning into deserts since plant roots are no longer holding the soil together during rain. Plants not only help people to breathe but they also keep the beautiful landscapes together so that deserts do not cover the world.

In this lesson students will draw and describe in a report what their hypothesis is when a cup of water is poured on a tray of soil with plants and a tray of soil without plants. After the experiment the students will figure out ways to stop erosion in the rain forests.

Procedure:

1. Explain that the students will be doing an experiment with soil. Show the students the type of materials that the class will use and what they are intended for. This experiment can be done in teams or as a teacher demonstration. Depends on what sources are available. Most supplies are of everyday use and can be found outside.
2. In front of the class have a tray of soil with grass (Tray A) and a tray of soil without plants (Tray B). Make sure there is a good amount of soil on the trays so that students can see the pattern the water will make.
3. Ask the students: Which tray (Tray A or Tray B) will displace the greatest amount of soil when the same amount of water is poured on to each one. Make sure there are empty containers on the floor for each tray so that the water and soil will go right into the container, this will create less mess.
4. Students will first make individual hypothesis about which container will displace the greatest amount of soil and why. They will write their answers on a piece of scrap paper. The teacher will then perform the experiment with the help of volunteers. Have the students in the audience determine whether the soil displaced will be high, medium or low on the trays. Students will respond to the following questions in their journals: What will happen when water causes soil erosion?
5. Tilt both trays so that one end is higher than the other, both trays need to be tilted the same way.
6. Next, stretch a paper towel around the tops of the empty containers. The paper towels are to be secured with rubber bands on the top of the containers; these will filter the water from the dirt.
7. Set the filters on the top of the containers holding the grass and just the soil. The volunteers must keep all water, dirt, and mud inside the bin.
8. Pour water in tray A, after water has filtered out and just left the dirt on the paper towel have the students draw what they see using labels on their scrap paper.
9. Do the same for Tray B, then have students answer the following questions on a piece of

- paper: Which tray displaced the most soil? Why do you think this happened?
10. After the experiment, refocus the students by asking what is the term used to describe what just happened with the soil? Erosion. How does erosion occur? Soil erosion occurs when unprotected soil is washed away by rainfall.
 11. Why was less soil eroded from the container with the grass? Plants prevent soil erosion by stabilizing the soil with their root systems. The roots grab a hold of the soil.
 12. As a class, write a general scientific understanding of erosion on the chalkboard so that all the students can understand. Have students come up to the chalkboard and draw pictures of erosion on landforms or what they just saw with the experiment.
 13. After the discussion build a hill on one of the trays out of soil then pour a cup of water on it. Tell the students that it is a hill in the rain forest. What are ways to prevent a landslide from occurring? Have the students answer this question on their piece of paper.
 14. Have the students then think of what would happen to the land and the animals of the rain forest when the trees are cut down and destroyed. Why? The students will have time to share their ideas with the class.
 15. At the end of the class, have the students turn in their hypothesis and ideas that they wrote down for the other questions. Determine if they should be graded or not.
 16. Have the students help cleanup after the experiment and take the remaining soil outside.

Further Assessment:

If it is a nice day, take the experiment outside. If, there are sufficient amounts of soil available have all the students get their own soil and perform the experiment of the rain forest hill individually. Have the students build other mountains out of other natural resources such as rocks and cement. Have students construct the hills that they described to prevent erosion in the rain forests. Make sure no land is destroyed in the process.



Macho Mountain Building

Objectives: Students will realize that water can change the appearance of land formations. Students will also acquire more knowledge about the concept of erosion, through a group consensus and using the assigned materials, design and build what they believe to be the strongest mountain possible to withstand water erosion.

Grade Level: IV to VIII form

Length of Activity: 55 minutes

Materials: Students will need writing utensils and scrap paper. The experiment requires pictures of land formations from books that can be found in the school library, small buckets, water, watering can, rocks, potting soil, sand and six copies of worksheet (Figure 9).

Source: Educator's Reference Desk

Subject: Erosion

Introduction:

Erosion is a natural, physical and chemical process by which the earth's rocks and soil are continuously worn down. Running water is also a major cause of erosion. Stones carried with a river's current scour and abrade the banks and beds. Ocean waves and currents erode rocky cliffs and sandy beaches, especially during storms. When an area receives more water than the ground can absorb, the excess flows to lower elevations, carrying loose soil with it. Erosion causes constant changes in land.

In this lesson, students will make their own mountain out of materials given to them by the teacher. Through instructions the students will see how their mountain will perform against the effects of water. Students will also record their data and drawings on a worksheet designed for this lesson.

Procedure:

1. Present land formation pictures to the class such as canyons, rivers, deserts, glaciers, beaches and etc. Pictures can be found in books in the library. Ask the students: What earth formations are pictured? What are they made up of? Are some of the materials harder than others? Do you think formations ever change in shape? How?
2. Discuss the erosion concept. Then as a class devise a definition of erosion. Discuss events that may have caused the formations in the pictures. Explain that erosion is not always a bad thing but is in fact essential to the creation of soil.
3. Apply the concepts discussed to the surrounding area by asking: which formations in the Transylvania areas that are made due to erosion?
4. Place the students into six groups. Explain to the class as a whole that their task will be to build a mountain in their dishpan that will withstand the effects of having water poured over it. Two groups will receive sand, two groups will receive potting soil and the remaining two groups will receive rocks as their building medium.
5. Instruct the students to make observations about their materials provided by the teacher. The group records their observations on their building plan sheets on page 49. Then each group devises a building plan. Each group will only receive one sheet so the group must decide on who will be the recorder. All students, not just the recorder, are to provide information on the sheet. The drawings are to be done by everyone individually on separate sheets of paper that will be turned in later. This is to make sure that everyone in the group is participating in the project.
6. Have the students draw and label their mountain design on their building plan sheet. Then the students can begin constructing their mountains. Make sure that students with the same building materials are not near each other.
7. Each group must only use the material provided by the teacher in their dishpan. After

the mountains have been built, ask the students to develop a written prediction of the effects water will have upon their mountain.

8. After all the mountains have been constructed have the whole class gather around each mountain as the water is poured over them from a watering can.
9. Discussion follows each result. Then have the students record and draw the results of their own mountain on the building sheet. Ask the students: Were their predictions right on? If not, what was different? Why did some of the mountains change more than others? What materials were used in the mountains that withstood the water best? In what ways did our mountains change from the effects of water? In what ways did they stay the same? Ask the students to compare and contrast the composition of the sand, potting soil, and rocks.
10. When students are done with their worksheets collect all the papers drawings and grade accordingly to what you see fit.
11. To reinforce understanding of erosion, the class can collectively build a mountain using any combination of materials that are in the classroom. If the students are outside for the mountain building lesson, they can use any materials outside but students cannot destroy or damage anything.

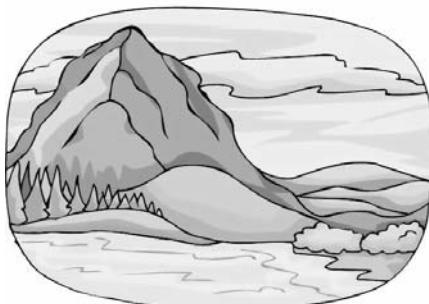


Figure 9:

Building Plan Sheet

Mountain Builders Names:

Mountain Name:

Supplies Used:

Write Three Words that describe your land material:

Draw and label a picture of what you want your mountain to look like:

Predict what will happen when water is poured on your mountain:

Draw and label a picture of what your mountain looks like after the water has been poured over it:

VI. Changing Environmental Habits



'Never doubt that a small group of committed citizens can change the world; it's the only that ever has.'

-Margaret Mead

Project: Clean Up

Objectives: To have students comprehend the environmental issues our planet faces and to help clean up a schoolyard as a team.

Grade Level: IV to VIII form

Length of Activity: 50 minutes

Materials: Trash bags and gloves for the students to wear. If gloves are not available, small bags are appropriate for the students to wear on their hands. Scrap paper and drawing materials.

Source: Educator's Reference Desk

Subject: Litter

Introduction:

Pollution is one of the world's biggest problems. There are so many types of pollution that harm us all the time but the one that people see everyday and participate in everyday and is littering.

Litter is any type of trash, which has not been properly disposed of and is usually thrown on the ground a great deal of people do not understand the harmful side effects of litter and how it affects aspects of our daily lives like our drinking water. A great deal of people who litter think that the litter will just disappear. Not only does littering affect us but it hurts the animals, plants and trees as well. Thanks to people the Earth is covered with litter. So let's put a stop to littering.

In this lesson students will brainstorm about the different types of pollution that affects the earth. Then they will participate in one event that can help the Earth, through a class cleanup. Students will see the different types of litter that are most abundant in the schoolyard and recycle the items gathered. Students will also see how a cleanup makes the school look better and cleaner for the Earth. After students will chart the different types of trash they cleanup on a bar graph.

Procedure:

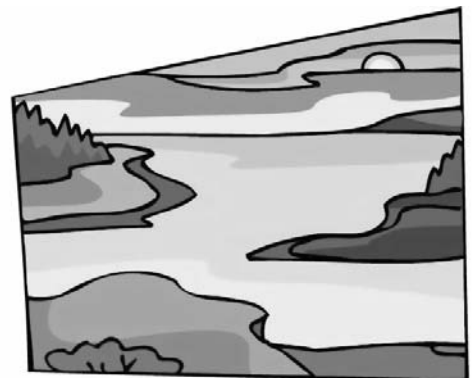
1. Discuss with the class and have them brainstorm different types of pollution that exists and their effects on the environment. Write all the different answers the students have on the chalkboard.
2. Explain to the students how pollution is one of the biggest problems that the earth faces and how much it affects the environment.
3. Ask the students how they think they can help. When one student says 'trash cleanups', stop the discussion and tell the students that is what they are going to do for that day's lesson.
4. Divide the class into two teams and give each student a pair of gloves and a garbage bag.
5. Explain the rules to the groups. Tell them that they have 15 minutes to pick up as much litter on the schoolyard as possible. Explain the boundaries as well to them so that they are aware of where they can and cannot go. Tell them that no sharp or glass objects are to be picked up by any student.
6. After the 15 minutes are up, gather all the groups together outside and have everyone sort out the trash into separate bags so that each can be properly discarded and recycled. Recycle the gloves too.
7. Have everyone go back to the class.
8. Ask each group to write down all of the types of trash that they picked up. Such as food wrappings, plastic bottles, etc. Then have each student chart all the types of trash they found on a bar graph and hand in their bar graph to the teacher or the teacher can hang up the bar graphs to remind the students what types of trash are found throughout the schoolyard.
9. Ask the following questions: What objects were most abundant? What objects were least abundant? What else can we do to help the Earth? Do we see how 15 minutes can help our Earth, imagine what 3 hours could do? What types of things can the school do as a whole to

keep the environment clean?

Further Assessment:

Have the students write letters to the principal, the mayor or the newspaper editor to get more people involved in cleaning up the environment through such activities as mass trash cleanups. Have the students organize a school cleanup once a month with all the students in the school. More students will take pride in their school when they realize they can be responsible for the outcome of what their school look likes.

Have students find out what materials are recyclable in your city, and create recycling bins for your school so that items can be recycled. Students can plan, as a class how/who will bring recyclable materials to collection places if there are recyclable centers in the area. Students can present these ideas to other classes and the principle to make a school wide recycling program.



Water Pollution

Objectives: To have students identify two or more pollutants in a bog, marsh, stream or other wetland area and to relate pollution prevention messages both through words and art.

Grade Level: IV to VIII form

Length of Activity: Two 50 to 55 minute sessions

Materials: Drawing materials, scrap paper, plastic garbage bags, and small plastic bags for student's hands or gloves, if available. 5 Plastic cups, cotton swabs, water and solutions to mix the water with but all different types mentioned in session two below.

Source: Educator's Reference Desk

Subject: Water Pollution

Introduction:

There are a wide variety of pollutants that can affect water and the plants and animals that live in the water. This pollution can be divided into three groups: chemical pollution, thermal pollution, and ecological pollution. Since not all pollution is human produced students through this lesson will understand that sometimes there are 'natural' reasons for some pollution. This activity will help students to better understand water pollution and its potential effects on human and wildlife habitats.

In this lesson students will learn the difference between the types of pollution that play in our everyday lives while at the same time cleaning a wetland area. Students will also use their creative skills to think of ways to promote and advertise not to pollute.

Procedure:

Session One

1. Take the students to a wetland area for them to become more aware of the water around them. In Satu Mare anywhere near the Somes River is good. Take with you garbage bags and some kind of protective plastic cover for hands. Have the students bring a writing utensil and a piece of paper.
2. When you get to the wetland area divide the students into groups of 3 or 4. Divide as evenly as possible.
3. Each group is to look around the wetland area and find as many sources/types of pollution as possible. On their scrap paper a designated recorder for each group will record the different types of pollution found. After 5-7 minutes, come together as a whole group and discuss the pollution that is seen. Since the visible pollution is often in the form of litter, discuss with your students that pollution may be present, but not seen. An example is: air pollution from cars, factories and houses, not smoke but Carbon Dioxide
4. After the group discussion is over, pass out gloves and bags to each group and have the students pick up litter pollution, take it back to the school and have students sort the trash for recyclable materials and put the litter into the trash dumpsters on the school grounds.

Session 2

1. Review with the students the types of pollution that they know about and what they saw in the wetland area that they went to.
2. Talk about the different ways people can help prevent certain kinds of water pollution. List them on the chalkboard. Explain to the students that they will be thinking of a logo to prevent water pollution.
3. Pass out to the students, scrap paper and drawing materials.
4. Have the students draw an environmental slogan or **logo** that will promote pollution prevention in wetlands and other water resources. Explain to the students that a 'logo' is

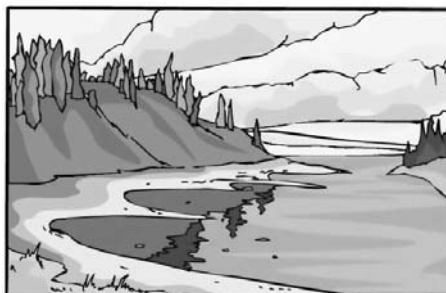
a design (like the Nike logo) and a 'slogan' includes words. The logo or slogan should be concise and have an obvious environmental theme related to pollution prevention.

5. Encourage students to think about the sources of pollution and ways to either prevent or ways to dispose of some pollutants.
6. After the students are done drawing, hang up the drawings around the classroom so students can see all the different ways of saying no to pollution.
7. The 5 different liquids should have definite tastes that the students will be able to recognize. Examples are sugar water, white vinegar, salt water, water mixed with lemon and tap water. This part can also be done earlier while the students are drawing.
8. Using cotton swabs have a few students taste each liquid (dispose of swab after each taste) and record what they taste on the board so that all the children can see. If time permits, let each child taste the liquids and have them record what they taste on scrap paper at their desk.
9. After the tasting of the liquids is done and the results recorded, explain that some kinds of pollution cannot be seen but still have an impact on drinking water, which can be unsafe for humans. Discuss what preventive measures can be used to keep bodies of water and drinking water clean.

Further Assessment:

Take the students to the wetland area several times a year to clean up the area and have the students mark down the difference in the area and how pollution is affecting the wetland area in an environmental journal. Do the students notice an abundance of litter in the wetland area through the year, if so, have the students contact the environmental agency, the mayors office or the newspaper found in the local area to maybe solve the problem of why so much trash and unseen pollution is concentrating in that area.

Have the students vote on the best logo or slogan that one of the students made up and have students make several posters with the winning logo on it and place the posters throughout the whole school. Have the principle adopt the logo for the school so that the whole school can come together under one message. The school adopted environmental logo or slogan can be used to represent the school when it is involved in environmental activities.



Environmental Fair on Recycling

Objective: To have students become more aware of the environmental concerns surrounding the earth and the importance of recycling and reusing garbage.

Grade Level: IV to VIII form

Length of Activity: Two 50 to 55 minute lessons

Materials: Clean trash

Subject: Recycling

Introduction:

Recycling removes materials such as metal, cans, plastic bottles, glass containers, and paper products from the waste receptacles before their disposal in a landfill. Once collected, these recyclable materials are sent to manufacturers and made into new products. Through recycling, the natural resources used to manufacture the original products are used again to make new products.

In this lesson, students will think of new ways to reuse the items they thought were useless. They will also learn the importance of recycling and how items they use everyday can be and are recyclable. They will use their imagination to turn a piece of clean garbage into something useful that they can use in everyday life.

Procedure:

1. Write the word **recycle** on the board. Ask the students to brainstorm what this word means to them and to the Earth. What kinds of things can we recycle? Some examples are: newspapers, metals, glass bottles and plastics bags. What items we use everyday that come from recycled items?
2. Explain to students that you have brought a bunch of clean garbage. Put all the garbage out and make sure there is enough so that students have a few options to choose from to complete the activity.
3. Have students come up to the table and look at all the garbage, so the students can see what was brought. If any students have any clean garbage that they would like to put in the pile tell them do so now.
4. Tell the students that they will be participating in a project with the garbage that is placed before them. They are going to turn the clean garbage into something useful while doing something good for the environment is reusing waste material instead of sending it to a dump.
5. Place the students into groups of two or more depending on the size of the class so that the class is divided into no more than fifteen teams. Have the teams sit together.
6. Explain the rest of the rules to the class:
 - All teams have to come up with an object out of clean garbage, make sure that all the objects are different, so that teams do not make the same thing.
 - They have to use at least one piece of clean garbage on the table in the classroom. They can also use any other garbage in their house, but it must be clean
 - No food allowed
 - Teams will make a product and their product will be displayed at an environmental fair that the class will put on the day that the project is due.
 - This **environmental fair** will be a contest where the students show their project to a group of judges and peers. All products will be presented and the judges go around and ask the participants to give a demonstration on their project. All students should stay near their product and cannot go around to the others till the winners are announced.
 - Judges can be other students and teachers from other classes. The principle and other

people who work in the school can be judges too. Pick judges who do not know the participants to make the competition as fair as possible. Tell the students that the judges will not be announced till the contest.

- Students can give a demonstration any way they see fit. They can have a song, a dance, a logo and etc. about what their product is. The idea is to sell their product to the judges.
 - Students must show the benefits of their product
 - No group of students can have the same idea. All ideas must be different.
 - Before students can work on their product using the garbage they must make preliminary drawings to see if their product will work and the drawings must be shown at the fair.
 - All groups must have a team name and their product must have a name too.
7. The students have the rest of the class to work on their project. They can think of their team names too. The students cannot take any piece of garbage off the table until their drawings are complete.
 8. The students can work however long the teacher wants them too. The only class time they have is this one. The product has to be done on the given due date. The rest of the work on the product will be done on the student's own free time.
 9. On the day of the environmental fair, set the classroom up so that all the products are space as far apart from the other as possible so that the judges can look at one product and not be distracted by the others. When the judges see a product have them stop and ask the students some questions. Make sure the judges regard all the products fairly and without criticism. Have the students give their presentation. Then have the judges continue on to the next product. As the impartial teacher, you should not to be a judge but instead have other colleagues if available be the judges.
 10. When the judges are done. Have the judges say something nice about each project so that all students feel that they did a job well done. Then have the judges announce the winners.
 11. The teacher should think about having certificates made for all the participants and winners to be given out by the judges during the announcement of winners.

Further Assessment:

Have the whole school participate in the environmental fair. Invite the local newspaper to take pictures of the event and of the winners. Invite the principle, the mayor or people from environmental agencies to be the judges of the contest. At festivals have the winners of the contest show the town the kinds of things that can be made out of clean garbage. Maybe the ideas of the products that the students made will catch on.



Making Paper

Objectives: To make paper from already used paper that students have written on and to use the recycled paper for an assignment.

Grade Level: IV to VIII form

Length of Activity: Two 55-minute lessons

Materials: Blender, scrap paper, water, two large tubs, large work space that will not be harmed by moisture, dishtowels, newspapers, rolling pin (if not available the lesson can still be performed) and a frame (look for frame ideas in the procedures section of this lesson).

Source: Environmental Education in the Schools: Creating a Program that Works!

Subject: Recycling

Introduction:

Paper is simple material. It is essentially a mat held together by the fiber's roughness, and can be made from almost any fibrous material like wood or recycled paper. The process for making paper was invented in China in the second century A.D., and all paper was made one sheet at a time until 1798. While the technology was evolved dramatically over the centuries, the basic steps are simple enough to be able to make paper at home.

In this lesson, students will learn how to make their own paper from recycled paper. Students will gain a better understanding of reusing resources again and the process of how to make paper.

Procedure:

1. Before the procedure explain to the class what they will be doing for the next two lessons. Tell them they will be making recycled paper out of the paper they used that day.
2. Collect all the paper and bring it to the center of the class where all the students can participate.
3. Remove any plastic, tape or coating from the scrap paper, and tear the paper into small pieces. Soak the paper in warm water in the plastic tub for at least 30 minutes or, if you can overnight.
4. Have each student make a frame while everyone waits for the paper to soak, if supplies are limited make only a few frames or just one, here is a choice of different frames to use:
 - **Wooden Frame:** Build a frame, which you will prepare for papermaking. If making a wooden frame, tightly staple or tack a wire screen to the frame.
 - **Wire Clothes Hanger:** Bend the wire hanger to make any shape of your choice. Cover the hanger with a nylon stocking and staple it to place. This choice of frame is the easiest to make especially if all students are making their own paper. The students can also bring in the supplies from home to, to make this frame.
 - **Embroidery Hoop:** Place a screen or nylon stocking between two hoops to make this inexpensive frame.
5. After the paper has been soaked for a half hour, start by having the students fill the blender halfway with warm water, then add a handful of the soaked paper. Making sure the lid is on tight, blend at medium speed until no longer the pieces of paper can be seen (the pulp will have a soupy consistency). You can blend in a piece of construction paper for color; or stir in short pieces of thread, dried flowers or herbs for texture.
6. Pour the blended mixture in the large tub and then fill the tub with warm water; mixing thoroughly until the ingredients are evenly dispersed.

7. Slide the frame into the tub, allowing some pulp to settle onto the screen and, still holding the frame underwater, gently move it back and forth to get an even layer of fibers on the screen.
8. Lift the frame out of the mixture, keeping it flat. Allow it to drip over the tub until most of the water has drained through. You should have a uniform layer of the pulp mixture on the screen. Press the pulp gently with your hand to squeeze out excess moisture. Soak up excess water from the bottom of the screen with a sponge.
9. Place clean dishtowels or newspaper on a flat surface and flip the screen paper-side down on the cloth or newspaper. Lift the screen gently, leaving behind the paper.
10. Cover the paper again with another cloth or newspaper and squeeze out extra moisture using a rolling pin or hands. Place the sheets out of the way to dry. Leaving paper overnight to dry will have better results.
11. When the paper is dry, pull the cloth gently from both ends, stretching it to loosen the paper from the cloth. Gently peel off the paper.
12. When the paper making process is over collect the left over pulp and throw it out or it can be placed back into the blender to be used again if more paper is made. Do not pour the pulp down the drain. Have students clean up any mess that they accumulated.

Further Assessment:

After the paper making process give the students an assignment that will make them write something on their paper. Have them describe the process of recycling on their paper or have students think of news ways to recycle items that they use everyday or have them create a process that the whole class can participate in.



The Trash We Pass

Objectives: Students will reveal the sources of pollution/ waste; develop an understanding of how the waste we make adds up, and to encourage themselves and other students to reduce their waste.

Grade Level: IV to VIII form

Length of Activity: 50 minutes

Materials: A scale, a full days worth of trash and a trash bag

Source: Earth Day Network

Subject: Recycling

Introduction:

Everything affects the environment. Trash is one of the largest contributors of harm to the environment, especially trash that is not disposed properly. Imagine if everyone threw away his or her trash on the road. There would be trash everywhere and no one would have space to walk around. Suppose if everyone throws away one piece of trash on the ground and multiply that by the population of Satu Mare, which is 130,000 pieces of trash on the street. That is a lot of trash. Multiply that by how many people live in Romania.

Students will measure how much trash that they consume as a class and find out how much trash is produced in Romania. Afterwards, students will figure out how much is recyclable and non-recyclable and the many ways to recycle items that are in their trash. For every piece of trash the student throws away, they will think of where it comes from and where it will go.

Procedure:

1. The teacher should collect a days worth of trash produced by the class by saving the contents of the garbage. The teacher may want to have a pre-arranged bag of garbage on hand with appropriate amounts of recyclable and non-recyclable contents.
2. In the beginning of class, ask the students if they think that they pollute/waste a lot. Why or why not? Write the answers on the board. Then, shock them with the following information: Did you know that only two man-made structures on Earth are large enough to be seen from space? Can anyone guess what they are? The answers are the Great Wall of China, and the Fresh Kills Landfill on Staten Island, New York.
3. After the beginning discussion, surprise the students by holding up a bag of garbage and announcing that it is the contents of one day's worth of garbage from the classroom.
4. Show the students the different contents of the garbage. (If garbage is messy, it is advisable to wear plastic gloves)
5. Have a student come to the front of the class and weigh the bag of garbage on the scale. As a class figure out how much garbage the school, city, county, and the country produces by multiplying the weight for the garbage by the number of students in the school and the people in the city, county and country. Stress to the students that these amounts are only for one day's worth of garbage. The students may want to figure out for one year by multiplying by 365.
6. Ask the students where their garbage goes and what happens to it.
7. Talk with the class about what materials can be recycled- plastic, metal, glass, paper and have them give examples of each. The examples do not have to be in the trash in front of the classroom but can be anything. Ask them what kinds of things can be made from the recycled items. Is there any place to recycle the materials?
8. Go through the items in the trash and divide into recyclable items and non-recyclable items. Teacher may need to describe the difference using some examples. Place the recyclable garbage in a different bag for recycling.
9. Weigh the bag of garbage without recyclable contents. How much less does this bag of

garbage weigh? Figure out the difference for the class, city, county, country and the world. Again, you may want to multiply this figure by 365 to figure out how the difference over a year. (If the weight difference is insignificant, emphasize the size difference.)

10. Challenge the students to produce less waste- have the students brainstorm what they can do to help. (Make sure they know that many forms of waste are harmful to the environment...ask them why.) Come up with ways that the city can produce less waste as a whole or the school. As a class, choose one item the class can do as a whole and start that day by doing the idea the students pick.

Further Assessment:

Have the students research composting and recycling efforts in the community. Discuss what they find. Is it satisfactory? What more can be done? Consider writing a letter to the editor of the local newspapers, community leaders, or mayor or other elected officials. Describe why the class is satisfied/dissatisfied with the community's recycling and composting efforts. Consult local government to learn what can be recycled in the neighborhoods and how to do it – collection times, special instructions, etc. but if there are no options have the class think of ways to get the local government to have its citizen's start recycling.



Speak Up for Recycling

Objectives: Students will plan and present a persuasive, well-organized speech promoting the establishment of a recycling program of a place of their choice. Students can also choose the topic of their choice in presenting their ideas to the class.

Grade Level: VI to VIII form

Length of Activity: Two 50 to 55 minute lessons

Materials: Writing utensils, researched information, and planned speech.

Source: North American Association for Environmental Education

Subject: Recycling

Introduction:

Waste reduction, reuse, and recycling efforts have been ongoing for many years in many schools across the world. Innovative programs are encouraging students to reduce, reuse, and recycle while using curriculum that supplements the learning process. The benefits of this knowledge translate into greater environmental awareness in the student's home. Awareness can stimulate participation in the community's waste reduction and recycling programs and lead to increased diversion and curbside recycling.

School recycling plans generally consist of two primary components: operational and educational. The operational component addresses the "how" of the school's recycling effort and the educational component addresses the "why" for students, faculty, and staff. This integrated approach appears to be the best fit for schools. Development of the plan's components should include all potential partners to ensure success. A team approach will involve:

- Program coordinators
- School and district administration
- Custodial and kitchen staff
- Students
- Faculty
- Waste hauler representative(s)
- Parents and community members
- Local government staff

In both primary and secondary schools, students can use classroom-recycling containers to separate paper, metals, plastics, and glass. The students or teachers can bring these classroom containers to collection bins for each building. Students can be encouraged to form an environmental/recycling club. A faculty advisor should be assigned who has an interest in the program as well as the time for supervision and guidance. One of the most effective ways of building awareness is through the recycling containers. They contribute to program visibility, and they can feature material information on the bins. Another way to promote the program is by posting a central bulletin board, including program information with charts showing materials recovered and other basic information. This type of information is helpful and can bring in new community supporters as well.

In this lesson students will learn how to write a persuasive speech to try and convince their peers, school and community to establish a school, community or county recycling program.

Procedure:

Day One

1. Ask students when they hear speeches given by individuals what kind of characteristics

do they notice makes a good speech. Write all the items that the students mention on the board. Why do people give speeches? Why is it important for students to learn how to give speeches?

2. Go over the key successes of developing and delivering a persuasive speech:
 - Think of some possible thesis statements, or overall message of the speech
 - Brainstorm ideas to support the statement
 - List the supporting ideas from the least persuasive to the most persuasive; this is the order in which they should appear in the speech.
 - Write a short introduction to the speech. Introduction includes: introduction of self, short history of situation or problem at hand, and the thesis statement.
 - Figure out a way to open the speech up by grabbing the audience. An example is to start with a question.
 - Write short transition phases leading from one reason to the next to give speech continuity
 - Write summary/conclusion that restates the problem and summarizes the most persuasive reasons, leaving the audience with an important point to consider.
 - Once the speech is written, practice the speech to know how long it is and to deliver it smoothly giving the audience eye contact and to not continually look down at the written speech.
 - Add to the speech anything else the teacher thinks should be mentioned already
3. While going over what makes up a speech give examples to the students so they can understand better. Explain also that speeches should be different from the rest. People remember the speeches that do not sound like every other one that they have already heard.
4. Tell the students that will be writing their own speech. The topic is how and why the school, the local community, and/or the county should install a recycling program. The student can choose which program that they would like to talk about. The students have to conduct research to get their facts straight about recycling, either from the library or from the web. If they are to repeat any information that they get from references they must site where they get their information.
5. The topic mentioned above is just an example. The students can choose their own topic on anything about recycling but it is advisable to have the teacher determine if the topic is appropriate.
6. The students will present their speech to the class in a time frame of no more than 3 to 5 minutes. The teacher can determine the time limit based on number of students in the class and time. The teacher can go over any other rules they think the class should know.
7. Students can have the rest of the class time to work on their speech, which is determined by the teacher or the students can work on their speech for homework.

Day Two

1. Each student will present their speech on recycling programs. This should take up the whole class time.
2. Students listening to the speeches should pay attention and ask questions afterward. Failure to do so can lead to deduction of points of their speech. This is to make sure that students will participate.
3. The teacher can grade the speech according to how they see fit.

Further Assessment:

Students can present their speeches to community groups, the city council, and/or the county commissioners if the speeches are persuasive. Students can attend public meetings on other

public problems and evaluate the effectiveness of the presentations. The teacher can invite lawyers to class to discuss techniques of persuasive speaking.

Students can establish their own recycling club with other members of the town or with other students of the school. The club should be separate from the classroom so that students do not get bored with the idea of recycling and do not associate it with classroom work.



VII. Renewable or Not



*'When we try to pick out something by itself,
we find it hitched to everything else in the
universe.'*

-John Muir

All Wrapped Up

Objectives: Students will understand the purpose of packaging and will be able to identify the difference between wasteful packaging and recyclable packaging.

Grade Level: IV to VIII

Length of Activity: 55 minutes

Materials: Writing utensils, scrap paper, and different types of product packaging, all of which can be brought in by the students and teacher.

Source: North American Association for Environmental Education

Subject: Packaging

Introduction:

Why do we buy one product instead of another? Often it is because of the packaging. Packaging accounts for 10 to 15% (and sometimes more than 50%) of the cost of a product and approximately 1/3 of what goes into a family's trashcan. Excess and non-recyclable packaging can add to our energy and waste problems. We can cut down on packaging. Packaging has several uses. It may provide protection to a product during shipping. It may provide protection to the consumer by preventing contamination or tampering. Of it may prove a useful marketing tool for the manufacturer. In some cases, the packaging may serve multiple purposes.

Packaging often differs from culture to culture. For example, Americans expect their purchased items to be placed in a paper or plastic bag as a convenient method of carrying their item home. For Romanians, however, frequently go to markets and grocery stores with their own bag or basket, which is used over and over again. Packaging often serves as a way to promote a product, and we often are lured into buying something we may not really need.

In this lesson, students will comprehend the ideas that go behind how companies package the items the way they do for their products. Students will improve the products they use everyday by creating a different kind of packaging that is less wasteful and present their ideas to the class.

Procedure:

1. Before the lesson, ask students to bring in examples of packaging, examples are food packaging, household products, boxes for electronics, old magazines and etc. The teacher can bring in examples of packaging for the students, too.
2. Start off the lesson by discussing each of the examples of packaging that the students brought in. Why is the product packaged the way it is? Answers can range from: to protect the product, protect the health of people, prevent theft or tampering, provide advertising, provide convenience to the customer, promote purchasing, and make the product look larger or more appealing. Is the packaging essential, or wasteful? Why or why not? What criteria are you using to make your decision on buying the product? What influence do you think packaging has on how well the product sells?
3. Take all the packaging that is brought for this lesson and have the students design a way to categorize the packaging. For example: sort it according to: 'natural' packaging (bananas, apples, peanuts); recyclable packaging (returnable bottles); and non-recyclable packaging.
4. Discuss after the sorting process with students: What happens to the packaging once the product is used? Which packaging is made from: recycled materials, renewable resources? Which packaging would you label: most wasteful, least wasteful? Why?
5. Break the class into small groups of four. Give each group one of the packages. Tell the groups that they are the company that makes that particular product that is in front of them. Make sure all the groups have a different item. The company has had lots of complaints about their merchandise because it uses too much packaging. Each group has to think up of ways to reduce the amount of packaging for that item. Have each team come up with

solutions. The groups can draw, write out or think up of other creative measures to reduce the packaging.

6. Each group has to present their ideas to all the other groups and the teacher.
7. After all the presentations are done, discuss again with the students what they learned in the lesson. Such questions as: List three examples each of recyclable and non-recyclable packaging? What criteria might you consider when deciding whether packaging is necessary or wasteful? What happens to most of the packaging you purchase? What do you think about this?

Further Assessment:

Invite a guest speaker to the class who deals with packaging from one of the local factories. Have the speaker talk about different ideas that go into packaging. Have the students ask different questions on why the company packages their products the way they do.

Students can send their new ideas, drawings and detailed descriptions on packaging that they completed for the lesson to the companies whose products they helped recreate.



If a Tree Falls in the Forest

Objective: Students will identify by-products of what comes from the forest and is used in their everyday lives; and describe several ways in which people depend on forests.

Grade Level: IV to VIII form

Length of Activity: 55 minutes

Materials: Drawing materials and scrap paper

Source: National Geographic Xpeditions

Subject: Forestry

Introduction:

Forests cover nearly one-third of the Earth's land and provide us with wood, food, medicine, paper, and many other products that we use everyday. Forests also oxygenate the air, modify climate, and contribute to our recreational and personal needs. Forests are very important in our everyday lives and without them life would be very different and harmful to people.

In this lesson, students will explore the role that forests play in their own lives by listing everyday products made from trees, then researching and categorizing less common products that may be less familiar to students.

Procedure:

1. Write the following on the board: The average Romanian uses wood and wood products equivalent to one tree a half meter wide and 30 meters tall. Talk to the students on why this is and do they think this is a lot for someone.
2. As a class brainstorm a list of common products derived from trees so the students can figure out why the dependency on trees is so high (for example, writing paper, money, and books). Ask the students if they can think of benefits trees provide (for example, shade, recreation, and oxygenation of the air). Tell the students that there are countless other products that contain components derived from wood that may not be as obvious.
3. Have the class develop (or the class can be split up into small groups) another list but with different categories for forest products which will help the students think more about trees, such as the following:
 - Food from trees: almonds, chestnuts, walnuts, lemons, cinnamon, olives, coffee, apples, and etc.
 - Products derived from all parts of a tree: pencils, books, carpets, firewood, ink, chopsticks, houses, luggage, golf balls, cardboard, tissues, magazines, cleaning compounds, tea bags, newspapers, beds, fish food, colognes, boardwalks, napkins, guitars, shampoo, helmets, bottle corks, medicine, chewing gum and etc.
 - Environmental benefits of trees: absorbing noise pollution, absorbing Carbon Dioxide which causes global warming, providing oxygen, providing shelter for birds and other animals, holding soil in place and etc.
 - Recreational uses of trees: climbing, tree houses, making canoes or other types of boats and etc.
4. The class may end up with other categories that might include aesthetic values, providing shade from the sun, serving as windbreaks, and cooling hot asphalt or concrete. Teachers can think up of more categories if he or she wants.
5. After the lists are done, have the students share with the class the lists that they came up with if the students were split up.
6. Explain to the students the assignment for the lesson. Have students imagine a day in their lives without trees. How would their routines differ? How would their

environments change? Have the students prepare a short illustrated story about their day, or a facet of it, without trees. If they would rather not draw than students can write a short story describing their day, instead. They might opt to describe their school day, a sporting or recreational event or home life. The students can pick what they want to draw or write about but emphasize that nothing in their pictures can be made of trees.

7. Once the students are finished with their assignment, the students can share their drawings and stories with the class or they can turn the assignments in for a grade.

Further Assessment:

Have the students conduct research to find out about some of the less obvious benefits of trees. Have them use the library or the web to identify the more obscure uses of trees. Create a class list of the products and uses that the students find. Challenge students to investigate the manufacturing processes involved in making these products, including what part of the tree is used for each product or derivative. As new products get added, have students explain what they discovered about them. Students can also identify and research local forest issues – in particular, threats to forests, such as fires and insect infestation, what programs are in place in Romania to prevent such threats to Romanian National Forests?



Energy Conservation

Objectives: Students will identify the importance of energy conservation and how it plays an important role in our daily lives and for future generations.

Grade Level: IV to VIII form

Length of Activities: Two 50 to 55 minute activities. The activities are two different lessons that look at energy conservation and do not have to be performed simultaneously with each other.

Materials: Two thermometers, two clear plastic bags (one small and one large), two twist ties to tie the garbage bags up. Resource materials on energy sources and writing utensils.

Source: Environmental Protection Agency

Subject: Energy

Introduction:

Energy conservation helps ensure resources for the future and also helps prevent pollution. If we continue to consume nonrenewable sources at an increasing rate, these sources will be depleted. The use of **fossil fuels** contributes to air and water pollution. For example, carbon dioxide is produced when oil, coal, and gas combust in power stations, heating systems, and car engines. Carbon dioxide in the atmosphere acts as a transparent blanket that contributes to the global warming of the earth, or 'greenhouse effect'. It is possible that this warming trend could significantly alter our weather. Possible impacts include a threat to human health, environmental impacts such as raising sea levels that can damage coastal areas, and major changes in vegetation growth patterns that could cause some plant and animal species to become extinct. It is important to conserve our current supply of fossil fuels or to use renewable sources so that our natural resources will be available for future generations.

In these lessons will gain a better understanding of how fossil fuels, global warming, and renewable and nonrenewable resources impact the environment. Through research, experiments, and discussion students will learn to conserve energy in a better way.

Procedure:

Day One

1. Begin the lesson by asking the students to define **energy**. Ask the students to name all of the activities they enjoy doing during the week. Could they do these activities without electricity? Write all the answers on the chalkboard so that students can see everyone's answers.
2. Point out that there are many types of energy and electricity is a common type that we use daily. Explain the difference between renewable and nonrenewable energy sources.
3. Describe the sources from which energy can be derived from such as sun, wind, water, vegetation and internal heat of the earth (renewable sources) and fossil fuels (nonrenewable sources).
4. Emphasize that nonrenewable sources are limited and once they are used up they are gone forever. Explain that electricity is also generated from nuclear energy, but nuclear power plants are no longer built because of the environmental threats created from disposing of nuclear waste.
5. Have the students imagine that all electricity in their community comes from only one source and that because of the increase population of the neighborhood, demand for electricity is growing.
6. Divide the class into groups and assign each group a different energy source: wind power, hydropower, solar power biomass, geothermal, oil, gas, coal and nuclear power.
7. Instruct the students to research their energy source using the encyclopedias and resource books available in the class or the library or on the Internet.

8. Have each group find out how the energy source is supplied, its costs relative to other sources, and the advantages and disadvantages of using the source. This might take some time. Give the students the rest of the class time or if books are readily available the set the students on a time limit on the books so that everyone could look through the books.
9. Have each group discuss their findings with the class. The class as a whole should find the best new energy source to use in their community.

Day Two

1. This exercise should be done at the beginning of the lesson due to that the class has to wait 30 minutes to see the results. Discussion about what is happening will take place after the plastic bags are taken care of.
2. Lay one thermometer inside a small bag. Inflate the bag by blowing into it, and then close the end with the twist tie. Put the inflated bag inside the larger plastic bag.
3. Inflate the large bag with air and close the end with the twist tie. Place the bag in direct sunlight, and lay the second thermometer next to the bag.
4. Observe the temperature reading both the thermometers after thirty minutes. Have a student help with the bags and have the other students observe what is going on with the bags.
5. Place the bags back in the sun. Explain to the students that both layers of air allow radiant energy from the sun to enter, and this radiation energy is absorbed and trapped when it is reflected back from the earth. As a result, the temperature near the earth increases, as it does in a greenhouse. Similarly, in this demonstration, when sunlight enters the outer bag (or the earth's atmosphere), the inner bag (or gases in the atmosphere such as carbon dioxide) absorbs and re radiates the heat back toward the thermometer (or earth), thereby raising the temperature. This situation represents **global warming**.
6. Emphasize to the students that as more gases are released into the atmosphere through the use of fossil fuels, the more heat is absorbed and trapped in our atmosphere.
7. Discuss what is global warming to the students. How does it affect everyday life? Is it something to worry about, now?
8. Have students think of the negative effects of global warming. Examples include droughts in continental interiors that can destroy crops, extreme climatic events such as hurricanes and floods, rising sea levels because of the melting glaciers, and species loss due to changing vegetation growth patterns.
9. Ask the students to break up into pairs and tell each pair that they have to think of ten habits that they can change to reduce their contribution to global warming. Have each group present their list to the class. Tell students to try to have different habits that other groups have not listed. List all the answers on the board. Talk about different habits that they can change that were not listed.
10. Thirty minutes should have passed. Check the thermometers in the plastic bags. Have one of the students read both of the thermometers and write the numbers on the board. Is there a noticeable difference in the temperature? Ask the students further questions about global warming and the rise of temperature in the bags.

Further Assessment:

Ask the students to name all the household appliances they have at home that they believe consume energy. After students list all the appliances have them find out how much energy that they consume, which can be done through a little research from the library, the Internet or by looking at the boxes that the appliances came in. After, have the students create a Household Appliance Energy Quiz. The quiz can be designed in any way that the students want. The point of the quiz is to show people how much energy that the appliances they use everyday consumes. The quiz can be distributed between family and friends, other classes, and the community. The quiz can also be printed in the local newspaper so that people can take the quiz and see how much energy that they consume.

VIII. Different Species, Different Regions,
Different Ideas



*‘Chase nature away, and it returns at a
gallop.’*

–P.N. Detouches

Environmental Issues in the Polar Regions

Objectives: Students will list environmental problems they are familiar with and check the ones that affect the Polar Regions and create magazine advertisements to encourage the public to support environmental protection of the Polar Regions.

Grade Level: IV to VIII

Length of Activity: 50 to 55 minutes

Materials: Drawing supplies, scrap paper, and wall map of the world if available.

Source: National Geographic Expeditions

Subject: Polar Regions

Introduction:

The Polar Regions are frequently neglected in discussions of the environment, but they should not be. The environment of the Polar Regions is particularly susceptible to human impacts such as pollution and the depletion of the ozone layer. Moreover, the effects of global warming on the Polar Regions are likely to have major repercussions in the rest of the world.

Students will learn about how environmental problems affect the Polar Regions, and they will create magazine ads to educate the public about these problems and to convince people to pay more attention to human impacts on the Arctic and Antarctic.

Procedure:

1. First start out with asking students to point out the Polar Regions on a wall map of the world and then ask them to describe some of the differences between the Arctic and the Antarctic.
2. Then ask the students to think of some daily environmental problems, either locally or in other parts of the world. List all the ones that students mention on the chalkboard so that every student can see the answers. Then have the students decide if each environmental problem they listed might impact the Polar Regions more severely than other parts of the Polar Regions.
3. Have the students try and answer the following questions, if the students are not able to then take the students to the library to figure out the answers:
 - What is the ozone hole, and what are its effects?
 - How does global warming affect the Polar Regions and what implications might this have for the rest of the world?
 - What types of pollution threaten the Polar Regions, and why are these regions frequently more sensitive to pollution than other parts of the world?
1. After the discussion, point out to the students that since the Polar Regions are very sparsely inhabited, many people are unfamiliar with the characteristics of these areas and do not think about these parts of the world when they consider human impacts on the environment.
2. Ask students to think about the reasons why it would be beneficial for more people to be aware of environmental concerns in the Polar Regions. Have them create public interest magazine advertisements that aim to convince the public to support environmental protection in the Arctic and Antarctic. Their ads should include information about the Arctic and the Antarctic regions. Students can also write articles about the Arctic or Antarctic if they feel more comfortable instead of drawing.
3. Students can work in pairs or individually, depending on what the teacher prefers. The

assignment can be given as a homework assignment if the teacher wants specific information on their ads. The Internet is a good source of information on the Polar Regions. Each student to the class can also present the assignment.

4. When all the ads are done, the teacher can collect everything and make one magazine that the class can share with others. The ads can be placed all over the school so that other students and teachers can be more aware of the Arctic and Antarctic regions.

Further Assessment:

Have students create 'environmental fact sheets' that could be given to members of environmental organizations, politicians, the school or the general public to educate them about specific environmental issues concerning the Polar Regions. Students can get their source of information from the library and the Internet. Each student can be responsible for one question and when all students are done the fact sheet can be put together. The fact sheet can be distributed on environmental days that are celebrated throughout the year. The fact sheets should describe the causes, effects, and predictions for the environmental problems students have learned about the Arctic and Antarctic regions.



Why are Species Endangered?

Objective: To help students understand and gain a new perspective on human issues that continues to endanger species and threaten our global environment.

Grade Level: IV to VIII

Length of Activity: Three 50 to 55 minute lessons but can be determined by the teacher too.

Materials: Drawing materials, large piece of paper for each group to create a poster, scissors, glue, Xerox copy of Endangered Species Profile (Figure 10) for each group but if not available the worksheet can be written on the chalkboard.

Source: Science Net Links

Subject: Endangered Species

Introduction:

Earth's ecosystems are comprised of many different life forms, including plants, animals, humans, and other organisms. These various life forms are highly interdependent on each other and the ecosystems to which they belong. These ecosystems continually shape and are reshaped themselves by the planet's landscapes, oceans, and atmospheres. Booming human population growth over the last two centuries has put, and continues to put, many of these life-sustaining systems out of balance and in serious jeopardy, endangering many of the plant and animal species that human beings directly and indirectly depend upon for long-term survival.

Growing human populations naturally mean increases in human activities worldwide, leading to changes in landscapes, oceans, and atmospheres. For example, human activities like reducing the amount of forest cover, increasing the amount and varieties of chemicals released into the atmosphere, and intensive farming have changed the earth's land, oceans, and atmosphere. Some of these changes have decreased the capacity of the environment to support some life forms.

The National Wildlife Federation (NWF) forecasts that the human population is slated to reach 8.5 billion in 2025, up from 5.2 billion in 1990. Right now, the NWF asserts that plant and animal species are disappearing at least 1, 000 times faster than any other time in the last 65 million years. It also claims that habitat loss is accounting for almost 75 percent of the extinctions occurring now. While statistics become more and more staggering, human beings seem to be doing very little to address these long-term, disastrous issues.

Students will learn in this lesson the natural and human causes of species endangerment and the kinds of present and future threats that species endangerment and extinction is causing. They will do this through classroom discussion, research and a team design of a 'Save Our Animal' poster of an endangered animal of their choice.

Procedure:

Day One

1. Start off the lesson with an open class discussion with some of the following questions:
Is the world a safe place for all animals and plants? Why and Why not? What does it mean for a species to be endangered? What, if anything, do you know about this topic? What animal or plant species do you know of that are endangered or extinct?
2. Once the students realize the lesson will be focused on endangered species have the students answer more questions:
 - Why do you think species are endangered?
 - How do you think or feel about this ongoing global problem?
 - What, if anything, happens when an animal or plant species becomes extinct?

- How do you think this situation can be realistically improved? Why should it be improved?
 - What is the difference between a threatened species and an endangered species? (Endangered species are those plants and animals that are so rare they are in danger of becoming extinct. Threatened species are plants and animals whose numbers are very low or decreasing rapidly. Threatened species are not endangered, yet, but are likely to become endangered in the future.)
 - Why should we protect endangered species? (Some possible answers might include: saving species preserves ecosystems: species are an important part of what makes up ecosystems; maintaining healthy ecosystems ensures a healthy biosphere; practical uses of species; when species become extinct, we may lose a potentially valuable product; and aesthetic reasons: when species become extinct, we lose objects of fascination, wonder, and beauty.)
 - As human beings, how do you think or feel about his ongoing global and potentially disastrous problem? (Accept all answers. Encourage students to support their feelings and views with examples.)
 - How can you as an individual help this cause? (Possible answers might include some of the following: support zoos, nature centers, nature reserves, or botanical gardens, volunteer time, money and ideas, start a native plant garden or use a spot in your backyard to attract wildlife, avoid buying ivory, snake skin belts, alligator boots, and other products made from endangered animals; and keep learning about plants and animals; share what you have learned with others.)
3. Now that students are focused and well oriented about the ongoing threat to endangered species, explain to the class that they will take on a special 'Save Our Animals' project where the students will create posters of endangered species to promote greater environmental awareness for the classroom the school and community.
4. Explain the rules to the class:
- In teams of three, have the students find an endangered animal that they would like to work towards saving and create a colorful, interesting, and informative poster that could be placed in parks, schools, and communities to draw attention to environmental issues and their animal's threat of extinction.
 - Before they can create the posters, they will need to develop a better understanding of the threat to their particular endangered species, particularly the problems, causes, potential solutions, and potentially disastrous effects to the world and humanity if this species were to die off and the leave the world forever.
 - To do this, they will need to do a general research on the topic of endangered species; the library and the Internet are useful tools, and then select an animal species that they would like to help. As part of this process, they will have to fill out an Endangered Species Profile student sheet (Figure 10) on the animal and present it with their completed poster to the class. These profiles should include basic information about the animal, important facts and statistics about its status, and recommendations on effective ways to get the world's attention about this dying species. The profile sheet can be Xeroxed and given to each group but if Xerox is not available then the teacher can write all the questions on the board and students can copy their information down.
 - Have the students read over the Endangered Species Profile student sheet to determine what kind of information their team is required to find out about the animal they choose because the information might be useful to include on the poster.
 - Since posters are a form of advertising, it is important to approach the project thinking about what will be the most interesting, persuasive, enlightening, and effective way to reveal the endangered animal to the public. Since the endangered species problem is essentially about life and death and the ongoing deterioration of the world, the students

may want their posters and profiles to include eye-opening statistics and other related scientific data. Though presenting basic facts and statistics is effective, it seems that gaining the public's often-distracted attention about this very serious and dangerous matter calls for more creative approaches.

- To create the poster, each team will need a large sheet of paper, drawing materials, tape and other related materials. The posters must present the following information: both common and scientific names of the animals, brief description of its habitat, description of the main reason why the animal is endangered and a drawing or pictures of the animal. Depending on their preference, the team may adorn their posters with printout copies of the animal, a drawing or drawings of the species based on photos, or both photos and drawings.
 - The team will need to decide which members will work on which aspects of the project. It is recommended that all members of the team participate in the general reading and animal selection process. Then one member should handle one of the following tasks: research and animal profile, advertising approach, or poster creation. Since all the areas are dependent on the other, it is important that team members work well together in exchanging ideas and developing the most informative and effective posters and animal profiles.
 - Once posters are done, each team will present their poster to the class and the teacher will grade accordingly to what he or she sees fit. It is important to let the students know they will not be graded on what option they choose for their pictures, but the overall creativity of their design, layout, message, and impact of the poster will be graded upon. Content and impression are the keys in this exercise.
5. Once all the rules and questions are answered about the project break the class into teams and distribute the large poster paper and the Endangered Species Profile to each team. If there is time left over let the students get into their groups to discuss what animal they will pick. Make sure that no animal is repeated twice.

Day Two

1. Teams will continue to conduct research and handle their posters in the best way possible, which should take up most of the class time. The teacher can have this as a homework assignment to not use class time but the teacher can oversee all the posters and to answer any questions for the students if the class time is used appropriately.

Day Three

1. Each team will present before the class their animal's Endangered Species Profile as an introduction to their poster presentation. Tell the students to be prepared to answer any questions about their selected animal.
2. Each team must present their poster and group members must speak at least once for the presentation.

A Small List of Rare Animals:

Source is www.animalinfo.org/rarest.htm, which includes information on all the animals listed, pictures and scientific names too. Give the students the web address if they would like to find detailed information on their animal but inform them that it is in English.

- Yangtze River Dolphin
- Javan Rhino
- Assam Rabbit
- Northern Hairy-nosed Wombat
- Dwarf Water Buffalo
- Yellow-tailed Woolly Monkey

- Cambodian Forest Ox
- Submatran Rhino
- Iberian Lynx
- North American Right Whale
- Black-faced Lion Tamarin
- Ethiopian Wolf
- Giant Panda
- Bactrian Camel
- Golden-rumped Lion Tamarin
- Indus River Dolphin

Further Assessment:

The class can decide whether to post their posters in the community or to send them as a group to a wildlife organization for possible use in its worldwide publicity campaigns. The local newspaper can print the posters in the newspaper. The posters can also be posted in the school for the other students to learn about the endangered species. Students may also want to do a broader research on their species and if so can write a report on all the findings that they gathered up and present it to the class at a later time.



Figure 10:

Name:

Endangered Species Profile

Directions: Fill in the blanks with appropriate information, ideas, and suggestions about your chosen Save Our Animals species.

Species Name:

Scientific Name:

Description of habitat:

Interesting facts about the species:

Population estimates or survival trends of species:

Reasons that this species is endangered:

Reasons that it is important to save the species:

Possible solutions to help this species survive:

Potential damage to the environment if this species were to become extinct:

Echolocation

Objectives: Students will learn what echolocation is about and the different ways that animals and humans use it especially bats.

Grade Level: IV to VIII form

Length of Activity: 55 minutes

Materials: Blindfolds can be made out of old material or scraps.

Source: The Bat Conservation Trust

Subject: Echolocation and Bats

Introduction:

Two hundred years ago an Italian scientist, Spallanzani, found that bats could fly in complete darkness in his studio even though threads were stretched tightly across the room. Then he discovered they could feed on insects in the dark. Charles Jurine, a Swiss, read his report and did some experiments. When he blocked the ears of bats with wax they were no longer able to find their way. Although it seemed that bats depended on their ears rather than their eyes to navigate, nobody understood why, as they appeared to make no sound. Not until 1920 was it suggested that bats might use high pitched or ultrasonic sounds. Then in 1938 a Harvard student, Donald Griffin, carried a cage of bats into a laboratory where apparatus had been set up to hear ultrasonic insect sounds. Here the sounds by which bats navigate were heard for the first time.

In this lesson, students will be able to understand echolocation and how bats use this process to fly without hitting things and finding food to eat. Students will also be encouraged to experience different ways to explore echolocation ways of demonstrating this, such as bouncing a ball against a wall.

Procedure:

1. Write the word echolocation on the chalkboard and ask the students what the word means to them and what kinds of animals use this. The key animal that students should mention is the bat since the whole lesson will mainly be about bats.
2. Explain what echolocation is for bats in better terms for the students to understand. Tell them that bats produce sound in their voice box or larynx. This is essentially the bat's larynx is proportionally much bigger than those of other animals. When the returning echoes – vibrations in the air- reach the bat's eardrums they are changed to vibrations in the bones in the inner ear, which send information to the brain. Ask the students to think of ways that humans use echolocation; some examples are radar, radio waves, and submarine detection.
3. Tell the students that they will play a couple of easy games to see how echolocation works:
 - Clear the room, put the desks on the side, make sure there is nothing on the ground that someone can trip over
 - Choose one person who will play the bat and that person will be blindfolded. The goal of the bat is to capture insects.
 - The rest of the students will be insects and the goal is not be captured by the bat
 - Choose a leader. The leader will pick one of the insects that the bat will then try to capture by pointing to them. After the leader points to an insect, he/she will say "go" and the bat will begin to make clicking sounds with his/her tongue. The selected insect will then make the same number of clicking sounds back. The insect will continue to echo the clicks of the bat so that the bat can listen and follow the sounds. The leader can pick the same insect or a few others when he/she wants to. The insects can move to make the

- game harder for the bat. The insect that is being pointed must echo back but if the bat changes their mind and moves to another insect, that insect does not need to respond.
- When the bat captures the insect then the bat and insect change.
 - There is no running
 - Play the game until the each student gets a chance to be a bat
 - The game can be played outside if the weather is nice
4. When the game is done have the students sit on the desks on the edge of the classroom and ask them questions: What did the bats feel trying to get the insects? Was it easy? What were the bats and insects frustrated about? Can human beings echolocate?
 5. Students will see if humans can echolocate by playing another short game.
 - Divide the class up into pairs.
 - Explain that one student will be blindfolded and the other will be the guardian to make sure that the blindfolded person does not walk into things.
 - The teacher will be the clapper. The teacher stands wherever they feel like it and clap their hands. Make sure the students walk slowly to the clapping teacher.
 - The teacher can move anywhere they want to during the clapping
 - Slowly have students walk blindfold towards the teacher, listening carefully before taking another step.
 - This game can work outside too.
 - After the students get near the teacher have the groups switch and try it again with the blindfolded people trying to find the clapping teacher.
 6. Once the game is done have the students return the classroom to its normal order. Ask a few questions to see how the students felt about humans and echolocation. Could the students tell when they were near objects or a wall? What about other people?
 7. Have the students imagine a world where people could not see but used echolocation instead. What kinds of things would be different? How would their normal everyday habits change?

Further Assessment:

Contact your local bat groups to help students further understand bats on a larger level. They will be able to organize bats walks and demonstrate on how to use bat detectors. Bat detectors will help further explain the echolocation process and students will be able to see it first hand. Invite your local bat group in for a lesson on bats, since they can explain in greater detail about bats.



Images of Bats

Objectives: To have students show appreciation of differing points of view towards bats. To have students learn the truths behind the myths about bats and to express their feelings and ideas about bats in a work of art.

Grade Level: IV to VIII form

Length of Activity: 55 minutes

Materials: Writing utensils and scrap paper

Source: The Bat Conservation Trust

Subject: Myths about Bats

Introduction:

People often feel very strongly about bats. Bats have a powerful image and often arouse strong feelings from admiration and respect to fear and dislike. The small group of writings about bats (Figure 11) is intended to be a starting point for a collection of poetry and prose, which demonstrates how feelings affect what a person writes.

Bats fascinate people. For centuries bats have used throughout the world as powerful images in art and craft. Some interesting facts about bats in world cultures are:

- The oldest known pictures of bats are wall paintings in an Egyptian tomb at Beni Hasen. They date from about 1,800 BC.
- In China bats are a symbol of good luck. The word for bat is 'fu', which is also the name of the character of happiness.
- The Mayas of Central America worshiped a bat god whom they believed to rule caverns and the realm of darkness.
- The coat of arms of the town of Valencia in Spain has a picture of a bat at the top.
- As sympathy with bats grows, they are more often represented with a friendly face in cartoons.
- An ancient Oriental folk-tale tells how bats were once birds that wanted to be changed into people. Their wish was partly granted – they grew teeth and hair, but still looked like birds. They were ashamed of being seen by the other birds, so from that time they came out only at night.

In this lesson, students will explore the different of images of bats in literature, art and design. After a discussion and a bat survey students will create their own works of art about bats to show appreciation of an animal that is very misunderstood.

Procedure:

1. There might be different attitudes and myths about bats between the students. Have the students answer the following questions to themselves, the questions can be written on the board or read aloud to the class:
 - Do you think bats get in your hair? Yes or No?
 - Are bats most likely to be found roosting in belfries – Yes or No?
 - Do you think bats are blind – Yes or No?
 - Do bats damage the places where they roost – Yes or No?
2. As a result of misunderstanding and fear of the unknown, many myths about bats are still believed. The truth is that: Bats are not blind, bats do not get tangled in people's hair, bats do not build nests, and most bats eat only insects. Go over other myths that students may have about bats. Discuss varying attitudes towards bats. Are they based on facts?

Prejudice? Misunderstanding? Or what? How can prejudice be counteracted?

3. The way people feel about bats can be affected by what they read and hear about them, even though this may not be the truth. Discuss with the students: How can they help to change the attitudes about bats?
4. Tell the students that there are many different types of works and art on bats. Bats are found, in paintings, coat of arms, and in literature. Read to the class one of the poems about bats to the students, or the poem can be read by one of the children. Pick one that best suits the students reading level. The poems about bats can be found on page 84. The interesting facts about bats in the introduction of this lesson can be read to the class too.
5. Have a discussion about the poem. Ask the students: What do they think the artist felt about bats? Are there any mistakes that the writer wrote about bats? The main one that is represented about bats is by John Swan, but his poem was written a long time ago when people knew very little about bats.
6. Read more poems about bats, and ask the same questions. The teacher can ask any other question that they feel is important to get the students thinking about the poetry. The purpose of the discussion of the poetry is to encourage the children to think more carefully about what was in the mind of the writer.
7. After the discussion session about bats. Tell the students the assignment for the remainder of the class. Students are to create their own work of art about bats. They can write a poem, create a short play, design an ad, and etc. Students will work on their own project. The main thing is that the work of art they choose to do must demonstrate how understanding and knowledge of bats can overcome prejudice and fear. The teacher can think of other criteria that are appropriate for the class and he or she will grade the assignment. The assignment can be turned in when the teacher decides and can take another class period too.

Further Assessment:

Have the students try the attitude questionnaire with their families at home. Have the students bring in their results and compare that with the other students. Which age group believes the bat myths the most? Which age group is most knowledgeable about bat facts?

Take the students bat watching one night. Invite a member of a bat group in your area to take the class to show the different ways that people detect bats with bat detectors.

Help students design a bat box designated to protect bats with the students. The local bat group can help in this activity too. To design a bat box: make sure the wood is at least 25mm thick, and untreated by chemicals. A landing area should be rough or scored with grooves. The entrance slit at the bottom should be between 15 to 20 mm wide. Put up several boxes rather just one, as high as possible and were people cannot bother the bats.

Figure 11:

Poems about Bats:

Myself, I rather like the bat,
It's not a mouse; it's not a rat.
It has no feathers. Yet has wings,
It's quite inaudible when it sings.
It zigzags through the evening air
And never lands on ladies hair,
A fact of which men spend their lives
Attempting to convince their wives.

- 'The Bat' by Ogden Nash

('A bat) is no bird but a winged mouse; for she creeps with her wings, is without feathers and flyeth with a kinde of skin, as bees and flies do; expecting that the Bats wings hath a farre thicker and stronger skin. And this creature thus mungrell-like, cannot look very lovely.'

- John Swan in 1635

Twinkle, twinkle little bat!
How I wonder what you're at!
Up above the world you fly
Like a teatry in the sky.

- Lewis Carroll in *Alice in Wonderland*

Lightless, unholy, eldritch thing,
Whose murky and erratic wing
Swoops so sickenly, and whose
Aspect to the female Muse
Is a demon's, made of stuff
Like tattered, sooty waterproof,
Looking dirty, clammy, cold.

Wicked, poisonous and old:
I have maligned thee!...for the Cat
Lately caught a little bat,
Seized it softly, bore it in.
On the carpet, dark as sin
In the lamplight, painfully
It limped about, and could not fly.

Even fear must yield to love,
And pity make the depths to move.
Though sick with horror, I must stoop,
Grasp it gently, take it up,
And carry it, and place it where
It could resume the twilight air.
Strange revelation! Warm as milk,
Clean as a flower, smooth as silk!
O what a piteous face appears,
What great fine thin translucent ears!
What chestnut down and crapy wings,
Finer than a lady's things-
And O a little one that clings!

Warm, clean, and lovely, though not fair,
And burdend with a mother's care:
Go hunt the hurtful fly, and bear
My blessing to your kind in air.

- 'The Bat' by Ruth Pitter

Other bat poetry is: *Bats* by Randall Jarrell, *Bat* by D.H. Lawrence, and *Midsummer Night's Dream* and the witches spell in *Macbeth* are two examples from Shakespeare.

Shades of Meaning

Objective: To have students use poetic form to explore a spectrum of ideas related to natural resources.

Grade Level: IV to VIII form

Length of Activity: 50 minutes

Materials: Drawing materials and scrap paper.

Source: Environmental Education in the Schools: Creating a Program that Works!

Subject: Environmental Art

Introduction:

Nature is a favored subject in poetry and literature and has been throughout the ages. Whether it is the colors of the sunset or the chaos of a storm at sea, people are awestruck by nature's beauty and majesty. They are inspired to describe the wonders that they see and feel around them. By observing nature one can see that, as human beings, we are not separate from nature; we are a part of the whole. Perhaps it is this sense of belonging and unity that moves us.

In this lesson, students will express through words how they feel and look at nature while using poetry. The prose they write can be kept to themselves or shared to the rest of the students.

Procedure:

1. Ask the students if they can name any works of literature, art or poetry that they think were inspired by nature. List the items that students mention. If the students cannot think of any, list a few and the students can follow after.
2. Explain to the students that they will be creating a work of poetry and that nature will inspire them for the words that they will choose.
3. Ask the students to write a diamante (a poem shaped in the form of a diamond) having something to do with nature and that demonstrates that words are related through shades of meaning from one extreme to the other. Have one word at the top and then have the next five lines go to the opposite of the chosen. For example, 'birth' and 'death' are two words that can serve to represent opposites. Any words the students choose will have either literal or metaphoric meanings related to nature, or both.
4. The words chosen should match the following pattern of parts of speech. Write this on the board so that students can see what their work should look like.

Noun
adjective adjective
participial participial participial
noun noun noun
participial participial participial
adjective adjective
Noun

5. If the students have trouble on understanding how to write this particular form of poetry write on the chalkboard how a diamante poem works. Use the example.

Birth
green bright
shining growing blooming
heat motion sun food
fading slowing dimming
brown old
Death

6. Suggested pairs of words with opposite meanings might include: exploitation – preservation, harvest – planting, and use – misuse, but make sure that the students choose different extremes.
7. Give the students time to think and write their poem.
8. After the students are done and there is time permitting, have the students draw on the piece of paper their poem is on. Have them draw an image that inspired their poem and or when they read their poem what image of nature they see. Hang the pictures with the poems in the class so that the students can be inspired by nature more often.
9. When students are done, if there are any volunteers who would like to share their work of art to the class let them read their poem out loud for the rest to listen. If students do not want to volunteer their work, they do not have to.

Further Assessment:

If students enjoy the idea of writing poetry that is inspired by nature have a poetry contest for the whole school to participate in. The winners can have their poems printed in the local papers for the rest of the community to read. For ecology events held at the school, have students read their poems out loud to the rest of the school for everyone to enjoy.



IX. Review of the Environment



*'Education is what survives when what has
been learned has been forgotten.'*

- B.F. Skinner

Environmental Jeopardy

Objective: To have students express their knowledge of the environment in a form of a quiz game

Grade Level: 4th to 8th

Length of Activity: 55 minutes

Materials: Chalkboard and chalk

Source: Texas Commission of Environmental Quality

Subject: Learning about the Environment

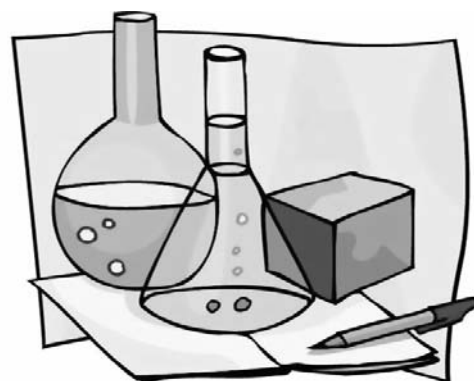
Procedure:

1. Tell the students that the whole class will be playing a game.
2. Split the class up into three groups. Ask for one of the students to be a scorekeeper. The scorekeeper will also help the teacher see which student put their hand up first.
3. Have the students pick out names for their team. This would make it easier for the scorekeeper to know the difference between the teams.
4. Explain the rules of the game:
 - The class is going to play a quiz game based on different environmental categories.
 - There are 5 categories per round with 5 questions each. The range of each question is 100, 200, 300, 400 and 500. 100 being the easiest and the questions worth 500 being the hardest. Groups can pick a question by first choosing the category and then choosing the amount of points they want to try for. For example: "Water for 300 points". The group can pick whatever category or amount of points they want.
 - Each group appoints a spokesperson to answer the questions. Only the spokesperson can answer the question, no one else. Of course, the spokesperson's group members can give the spokesperson the answer to announce.
 - When the spokesperson knows the answer, he or she raises their hand and the teacher calls on the first group who raises their hand. If the group says the right answer they get the points, but if they answer wrong then the points are deducted. Anyone who answers but is not called on, loses points for their team. Stress this point to keep students from blurting out answers when not called upon.
 - The group that answers the question right picks the next question.
 - There is a time limit of 10 seconds if a group raises their hand and does not answer
 - Some questions have various answers and if so the student who answers has to be as persuasive as possible towards the teacher to get the points.
 - If there is time for a second round, have different categories and higher point values, ranging from 200 to 1000.
 - After each round, tally up the points and which group has the most points is the winner.
5. Once the rules are explain, the teacher writes on the board the categories and point system. An example of how the board should look like to the students is like:

Water	Air	Plants	Animals	Pollution
100	100	100	100	100
200	200	200	200	200
300	300	300	300	300
400	400	400	400	400
500	500	500	500	500

6. The scorekeeper is off on the side keeping track of points earned and points deducted. The scorekeeper can only add and subtract points if the teacher says to. The scorekeeper

- should have the scoreboard where everyone can see it.
7. Once the rules, names of the teams and categories on the board are written the game can start.
 8. The teacher picks the first question and reads from the questions that they have compiled. The easiest way to have the questions is to have all the questions and answers on a sheet of paper so the teacher can hold everything in his or her hand.
 9. Sample questions can be found on the following page. Have the questions go along with what the students are studying. The sample questions are just a guide and might be too easy or hard for students.
 10. Enjoy the game with the students.



Sample questions for the teacher

Here are a few sample questions to use during the game, but it is advisable to make up different categories or questions if students want to play the game again. The questions range in difficulty, when assigning questions to points make sure the harder questions are worth more and the easier questions worth less. If making questions up, the best place to make up general questions is in almanacs and other reference materials. This game is good way for students to remember items for a test, can be used as a good study aid to go over test material. The answers are italicized and when students answer, it is the teacher's role to determine if the student's answer is right or wrong.

Air

1. Air consists of a mixture of gases. What are these gases? *Nitrogen, oxygen, carbon dioxide, small amounts of other gases, and water vapor.*
2. What is air pollution? *Things in the air that don't belong there*
3. What are three causes of air pollution? *Cars, factories, lawn mowers, fires, and etc.*
4. Name one thing you can do to help fight air pollution. *Answers will vary*
5. What are the six air pollutants currently should or are regulated by Romanian law? *Particulate, ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead. Answers may vary depending on time*
6. What is a particulate? *A microscopic particle in the air.*
7. Is ozone a liquid, solid, or gas? *Ozone is a gas.*
8. Where does air pollution go? *It moves along with the wind and if it gets high enough will enter the jet stream and sometimes travel thousands of miles.*
9. Name forms of natural air pollution? *Forest fires, volcanoes*
10. Do you think it would be better to ride the bus to school, or have your parents drive? Explain your answer.
11. What are some causes of ground level ozone pollution? *Car exhaust, burning and etc.*
12. What are the benefits of planting trees? *Trees produce oxygen that animals need to breath.*
13. What three things combine to make ozone? *Nitrogen dioxide, heat and low wind speed.*
14. Which one of these (refer to question number #5) can we control? *Nitrogen dioxide.*
15. What are the factors that determine an ozone action day? *Low winds, high temperatures, sun, high ozone count the day before.*
16. Is smog greater in the summer or winter? *Summer*
17. Name three things you can do when the ozone levels are very high. *Car pools, mow late in the evening, walk or ride a bike, stay out of the sun and etc.*
18. If people are aware that automobiles are a major cause of ozone pollution why don't they car pool? *Mainly for inconvenience reasons*
19. Name one of the 6 Pollution Gremlins and describe where it comes from. *Sulfur Dioxide— Burned coal and fuel oil, Nitrogen Dioxide—Fuels burned by cars, electric power plants, Lead—From smelters, Ozone—combination of sunlight and chemicals, Particulate— particles of smoke or dust, Carbon Monoxide—fuel burned without enough air, mainly from car exhausts.*
20. What time of day should drivers fill their car with gas to avoid polluting the air? *Late afternoon or evening*
21. What is a temperature inversion? *A meteorological condition in which pollutants are trapped beneath a layer of warm, stagnant air.*
22. What effect does air pollution have on animal life? *Answers will vary*
23. What part of our body is affected the most by ozone and why? *Lungs and answer will vary*
24. Are all pollution sources man-made, give examples? *No and a few examples are*

volcanoes and fires

25. When the air is polluted, can we always see and smell it? *No*
26. Millions of years ago, what were two sources of air pollution? *Dust storms and volcanoes*
27. Do most countries have laws against air pollution? *Yes*
28. What is the major pollutant in smog? *Ozone*
29. Which pollutant makes our rain more acidic? *Sulfur dioxide*
30. Which pollutant causes a yellow-brown haze? *Nitrogen dioxide*
31. Does carbon monoxide have a color? *No*
32. Can you smell carbon monoxide? *No*
33. How can a particulate harm your body? *By becoming enlarged in your lungs and producing scar tissue that keeps your lungs from expanding*
34. What is acid rain? *It is rainfall that has combined with air pollution such as sulfur dioxide and nitrogen oxide and increases the pH and acidity of the rain.*

Water

1. Why should we conserve water? *Because we cannot make anymore.*
2. Is there an unlimited amount of clean water? *No*
3. Can we produce new water? *No, all the water on the earth has been here all along*
4. Is most of the earth made up of water and at what percent? *Yes, 70 %*
5. What are two sources of our water supply? *Ground water and surface water*
6. What is water conservation? *Making the most efficient use of our water*
7. What are three things that you could do to conserve water? *Take a shower instead of a bath, don't let the water run when you brush your teeth, and install water conserving toilet other answers will vary.*
8. How could you implement a water conservation plan in your house? *Answers will vary*
9. Which of the following is an example of wasting water?
 - A) turning off the water while brushing your teeth
 - B) taking a shower not a bath
 - C) *letting the water run for 10 minutes so the water will heat up*
10. Which of the following is an example of conserving water?
 - A) washing a car in a river without a bucket
 - B) flushing a bug down the toilet
 - C) *taking a five minute shower*
11. Who are the three main users of water? *List them in order from most to least. Agriculture at 65 percent then industry then individuals*
12. What is a watershed? *Drainage basins or areas which could be a stream, lake, estuary, aquifer, or ocean*

Water Quality

1. What is water pollution? *Things in the water that don't belong there*
2. What are three causes of water pollution? *Pouring things in storm drains, boats, dumping things on the ground, etc. Answers will vary*
3. Name one thing you can do to help fight water pollution. *Answers will vary*
4. What makes the most water pollution? *Dumping things on the ground and the rains bringing it to the water source*
5. What effect does water pollution have on animal life? *Answers will vary*
6. What does a waste treatment plant do? *Cleans waste water for further use in homes and communities*
7. How long does it take to clean wastewater?
8. Where does the reclaimed water go once it is cleaned at the wastewater plant? *Reclaimed water is pumped into lakes where it will go through the treatment plant, then to the homes.*
9. What does the wastewater plant use to digest the actual wastewater? *Microorganisms*

that eat the wastes

10. What are two types of water disinfectant used by water treatment plants? *Chlorine and ammonia*
11. What is the water called that has been cleaned and ready for reuse at a wastewater plant? *Reclaimed or recycled water*
12. List 4 factors that may influence testing for water quality. *Time of year, temperature, wind, weather, man-made examples such as dams.*
13. Why would we do a bug count in a stream? *It gives us information about the living conditions in the stream*
14. What is needed for organisms to survive in a stream? *Oxygen and structures to cling to and hide in.*
15. What in water conducts electricity? *The salt in the water ions.*
16. What is Ph meter? *It is a tool that measures the acidity or basicity of a substance.*
17. Why would you want to know the PH of water? *This would tell you what kinds of things could live in the water and weather or not it was suitable for drinking*
18. What is a secchi disc? *It is a tool to measure the clarity of water.*
19. Why is it important to take a duplicate sample when making a test for water quality? *Duplicate samples are necessary to ensure accuracy in testing. You want to make sure you have a good sample and you didn't make a mistake in testing.*
20. What does Dissolved Oxygen stand for? *D.O.*
21. If there is a low dissolved oxygen level in a creek, will there be much life the creek? *There will be very little life, as all living things need oxygen.*
22. How do water temperature and dissolved oxygen affect each other? *The lower the temperature, the more oxygen is in the water.*
23. How does water movement affect the DO level of water? *It causes the dissolved oxygen level to rise*
24. Why do you need to have an aerator for fish in an aquarium? *This helps the water dissolve more oxygen and makes the environment more favorable to live in for fish.*
25. What is a reference site? *A water site that would represent good water quality*
26. What is non point source pollution and give an example? *Non-monitored pollution, unknown source of pollution. Example: Someone dumping oil into a storm drains which flows directly into our waterways or fertilizer run-off from lawns.*
27. Give two examples of non point source pollution. *Rinsing a paint brush in the yard, pouring used oil on the ground or in a storm drain, over fertilizing your yard, topping off your car's gas tank and etc.*
28. How does fertilizer pollute water? *If it rains immediately after someone has fertilized their lawn a lot of that fertilizer is going to be washed off of the lawn into the street and down into the sewers, which lead to streams and rivers.*
29. Should motor oil be poured into the street drain? *No*
30. If anything is poured into the street drain, where does it go? *Directly to the nearest body of water.*

Waste

1. Why do we recycle? *To save land fill space by producing less waste to conserve natural resources.*
2. Name three things that you can recycle instead of throwing them away. *Paper, newspaper, aluminum cans, and plastic products: milk jugs and plastic bottles, glass bottles or jars, and tops of plastic bottles.*
3. Name a product that Romanian manufacturers make from water paper? *Newsprint.*
4. How are Christmas trees recycled? *They are ground up and used as mulch around people's houses.*
5. Why do you want to recycle a Christmas tree? *Answers may vary*
6. What would you tell your neighbor to do to recycle? *Answers may vary*
7. How do you think your school could recycle more wastes? *Answers may vary*

8. What are waste areas in your school? *Paper and materials for storage such as cardboard boxes and etc.*
9. Do you think garbage should be taxed? Why, or why not? *Answers may vary*
10. Should waste management companies charge for plastic items? *Answers may vary*
11. Why is it important to recycle paper? *To save trees*
12. How can you recycle used clothes? *Give them to someone else; sell them to second hand stores, and etc.*
13. Where does trash go after it leaves your home? *To the landfill*
14. How can litter harm animals? *Answers will vary*
15. Name three advantages of sanitary landfills. *They cost less, protects groundwater, holds all types of garbage, ability to be used as recreational areas after use, contains residue, and can be a source of alternative energy and etc.*
16. Name three disadvantages of landfills. *It requires specific soil types, is accessible to communities, quickly filled up, and the ability to cause pollution if not managed correctly and etc.*
17. Why is the soil placed on top of a landfill impermeable? *It protects the surrounding soil from leakage and gases*
18. What is the percentage by weight of Romanian trash is discarded packaging? *30%*
19. If your job were to design packaging for products, what you could do to reduce the trash in landfills? *Answers may vary*

Compost

1. What is compost? *Grass clippings, leaves, decaying fruits and vegetables, and manure used as fertilizer.*
2. What are the four materials needed in a compost and where can you find these sources? *Carbon: leaves, twigs, shredded bark, straw, sawdust, nutshells, corncobs. Micro/Macro - organisms: snails, slugs, earthworms, fungi, mold, millipedes, springtails, and pill bugs. Nitrogen: grass clippings, garden weeds, horse/sheep manure, fruit rind and peelings, cottonseed meal. Water: juices from fruits, rain, faucets.*
3. Name three things that can go into a compost bin. *Any fruit, vegetables, juices, plant clippings*
4. Name 3 things that cannot go into a compost bin. *Oil, meats, and animal droppings*
5. Why should we compost? *So it doesn't go into the landfill*
6. What can we do with the composted materials? *Use it in our garden or flowers*
7. How can you recycle natural food products? *Compost them*
8. Explain what a compost bin is. *A compost bin can protect the compost from wind, rain, and sun. Bins can also make composting easier and improves quality.*
9. How can maintaining compost benefit the environment? *Compost will help replace the need for fertilizers that pollute our water system; by using scraps and grass clippings our landfills will be less full.*
10. How do you make a compost bin? *Make your own box structure, place it on the ground outside, and add compost materials inside the box*
11. Name one nitrogen source. *Grass clippings, garden weeds, horse/sheep manure, fruit rind and peelings, cottonseed meal*
12. Should cat or dog manure be used in compost and why? *No, because they can spread diseases.*
13. What are three advantages to composting with worms? *It takes less space, less work, is a faster way to compost paper, and creates a richer soil.*
14. What is vermiculture? *Composting with worms.*

Miscellaneous

1. What do you feel is the worst kind of pollution? Why? *Answers may vary*
2. What do you think is the most important concern for the environment today and why? *Various answers.*

3. What do you feel is the one most important way that you can prevent pollution? *Various answers.*
4. What law would you pass to protect our environment? *Various answers.*
5. What are three ways that your school practices conservation? *Depends on what the school has done*
6. List three ways your school wastes resources. *Various answers*
7. What is a habitat? *A home*
8. What is a synonym for conserve? *Save*
9. What is an antonym for conserve? *Waste*
10. What is point source pollution and give an example? *Waste management regulated and monitored by the government and an example is industrial discharge.*
11. Which saves more energy, washing clothes in hot or cold water? *Cold water*
12. Name three ways you can save energy. *Use less hot water, turn off electrical appliances, car pool, walk or ride bikes, turn thermostats up in the summer and down in the winter and etc.*
13. Are natural resources limited or unlimited? *Limited*
14. What is the purpose of fertilizers? *Fertilizers make plants grow better and to rid the soil of certain pests.*
15. When is Earth Day? *April 22nd*
16. What are the four major elements of a habitat? *Food, water, shelter, and space.*
17. List four things conservation does. *Extends limited supplies or makes resources last longer, drought proofs, reduces harm to the environment, saves money and etc.*
18. Explain the economy issue of ecology. *It is important to protect the environment while not hurting businesses that create jobs for the community.*
19. Why don't we see as many birds as we once did? *We are destroying their habitats.*



X. Bringing it all Together for the Teacher



*'We don't see things as they are; we see them
as we are.'*

-Anais Nin

Environmental Suggestions: Throughout the School Year

Here are a few suggestions on what to do with students outside of the classroom while exploring nature and to show different aspects of the environment. Bringing the classroom outdoors adds fun and excitement to learning about the environment.

Park Etiquette:

It is recommended to take students out and explore nature. Before heading out to explore nature, there are a few things to remind students about.

Source: Nature Park

1. Leave everything where you find it. Romanian laws protect all vertebrates and all parks have bylaws to protect all parts of nature including rocks, shells, cones and etc. Leave things for others to enjoy.
2. Turn rocks, logs and leaves back over and fill in holes when you are done.
3. Let the animals find their own food. 'A fed animal is a dead animal.' When we feed animals, we get them accustomed to our presence and they lose the fear of humans. The animals will then depend on humans and if the animal hurts someone or causes problem for someone, that animal usually winds up dead.
4. Leave the area as you found it or better. Carry out your garbage and stay on the trails.
5. "Leave only footprints, take only pictures" – benchmark saying about maintaining quality of nature around us.

Nature Winter Activities:

It is easy to connect with nature any time of year. Try the following activities during the winter with students.

1. **Go on a Hibernating Bug Hunt!** - Shine a light under bark looking for hibernating ladybugs, spiders, butterflies, or cocoons. Check out holes in trees; look on branch tips for sleeping moth eggs. On warmer days, watch for tiny pieces of dirt that seem to jump on the snow, these are snow fleas, which are tiny insects that scavenge the snow for bits of food. These bugs are what tiny birds are looking for as they probe with their beaks.
2. **Go Outside and Find Evidence of the Different Ways Animals Cope with Winter.** North-south and vertical migration, true hibernation, napping, storing fat, camouflage, growing a thick coat, fluffing their feathers, sleeping in tree cavities, storing food, eating different foods and shedding antlers are all ways animals adapt to winter.
3. **Experiment with Food Choices of Wintering Birds at Your Feeder.** Provide several choices in different feeders located near each other. Measure how much of each you put out. Record the daily temperature and note how much of each food is left at the end of each day. Is there a relationship between temperature and what the birds eat more of? Try providing sunflower seeds, raisins, and nuts. Also record the types of birds you see at your feeder and the general weather. This may help to explain some of what you see. What other things may affect the results? (The number of birds visiting the feeder.) Try the same experiment in the spring during warmer weather to compare the results. How do the results compare? What conclusions, if any, can you draw from this? How would you change the experiment if you were to try it again?
4. **Look Closely for Buds on Trees and Shrubs in Winter.** Most deciduous trees will form a winter bud in the fall to protect the developing leaf inside. Conifers do not form this bud until the spring. Try 'forcing' a bud by taking a small cutting and placing it indoors in sugary

- water near a window for a week or so. What happens?
5. **Really Look at Nature.** Close your eyes and have someone else find something nearby from nature for you to look at. Have them carefully lead you to the object with your eyes closed. When you get there, they place your face so that you will be able to look directly at the item, within focusing distance. When they touch your thumb, you open your eyes and look at the object as if you are taking a picture, then when they touch your thumb again you close eyes. With your eyes closed, describe the object to the other person. You will have a vivid image in your mind, which you will not soon forget.
 6. **Follow Animal Tracks in the Snow.** A trail of tracks often tells a story of the habits of an animal in the winter. A tiny mouse scampers about on the snow surface looking for seeds that are blown by the winter wind and then darts back to its tunnel. A daring rabbit leaves the protection of a thicket and gets grabbed by a hunting owl; the rabbit tracks disappear from the snow and the wing brushing the surface of the snow leaves an imprint. Deep tracks indicate a large heavy animal. Try leaving your own fake animal tracks that tell a story. Look for other signs such as a nibbled twigs and dug holes.
 7. **Measure the Snow.** Determine how much snow has fallen to date and measure the snow pack to see how much has accumulated. Try melting a known volume of snow in a pot to see how much water is actually in snow. Compare its melted volume with the snow volume.
 8. **Measure and Compare the Temperatures** of the air and snow, the snow at the surface, snow down at 25 cm and snow at 100cm. How would this help the animals that use the snow for protection from the cold? Would this help the animals hibernating under the snow? How? Try digging down to the soil surface in a natural area and brush away the snow to look for signs of animals living under the snow. Mouse tunnels, seeds, droppings etc, can often be found. Make sure to fill in your hole after your search.
 9. **Determine the Thickness of Ice** and how quickly it changes. From a secure area such as a permanent dock, chop a hole in the ice every week starting with the first ice in the autumn and measure the thickness of the ice. Record the daily temperatures for the same period. Stop when the ice gets too thick to chop. Graph the data and try to explain why the ice thickness changed as it did.
 10. **Make a Snow Fort.** Measure the air temperature outside a go inside. Take the temperature several times in the first 10 minutes of sitting inside it. What happens to the temperature? Why does this happen? What is the warmest temperature you can get inside the fort?
 11. **Have Fun Being Creative Outdoors!**

Summer Activities:

As the school year winds down, students want to be taken outside more. Here are some ideas on what to do with students at the end of the school year.

1. **Go on a Bug Hunt.** Equip students with a small glass jar and encourage them to look for natural life around them. Look under leaves and stumps (be sure to turn them back over), on tree trunks and leaves and in flowers. Handle the bugs gently and let them go when you are done. Name your favorite bug according to its colors, the way it moves, or something different about it.
2. **Listen to the World Around You.** Have students sit and listen to the sounds of nature by having them find a spot in the woods where they are by themselves. Make sure all students are in view. Have students close their eyes and count on their fingers the different sounds they hear. Compare natural vs. unnatural sounds. Try this in several different habitats such as a field, near a pond, and in a forest to compare the kinds and numbers of sounds heard.
3. **Get a New Perspective.** Have students lay face upward under a large tree. Have them look into the branches. Can they see the top branch? What patterns can they see? What other things are present? They can pretend to be the roots of the tree in the soil. What do they feel like? What animals can see moving around in the tree?
4. **Use Imagination.** Choose an area with natural ground coverings such as leaves, cones, wild grass, etc and sit down. Give students short pieces of straw or toothpicks. Have them pretend

to shrink down to the size of an ant. Their job is to lead a nature walk for creatures the size of ant by choosing 6 interesting things along a one-meter stretch of ground. Encourage them to use their imagination!

5. **Wet Noses.** Have students wet the underside of their nose. This improves their sense of smell just as it does for deer and rabbits. Find familiar smells such as flowers to have them try, and then go on to other things like having them rub a leaf between their fingers and smelling or scratching a pine needle. Also, try moss, bark, pitch, or grabbing a handful of leafy soil and anything else that is around the area.
6. **Discover Color in Nature.** Get 20 old paint swatches of various colors from a paint store. Cut them into individual squares and hand them to the students when in a natural area. Have your students look for each color. They will be amazed at what colors they can find if they really look.
7. **Touching Nature.** Have your students break up into pairs. Have one of the members of the group blindfolded and have the other person lead the blindfold person to a tree. Have the blindfolded person feel the bark texture, finding branches and any other way to recognize a specific tree without looking for it. After, have the blindfolded lead back to where they started. Have the students take off their blindfolds and then have them try and find their tree using their sense of touch to confirm it. Ask them what other senses helped them locate their tree? Reverse the roles and have the other person blindfolded and taken to a different tree.



Environmental Scavenger Hunt

A game that students can play while exploring nature.

Length of Activity: One hour, depending on how successful the teams are at finding the items.

Materials: A large sheet posted at 'home base' listing items to find. Have one person in each team write out the list.

Procedure:

Break the class into groups of 5 or 6 students. Each group is to visually find specific items off a list in an allotted space of time. They are not to pick, remove or hurt the environment in any way. Each group will mark on their list where they found the particular item. After all the groups are done and all lists are turned in. The groups and teacher will go around locating the items that the groups mentioned on their sheet. Students should be as clear as possible when listing where their items are. The team with the most items listed and found by the teacher is the winner. Tell students to be creative because the game will be boring if the students list all the same items.

A suggested list but can be changed depending on where the game takes place:

- Three things that are green
- Three things that are blue
- Something unusual
- Something that show man's influence on nature
- An animal's home
- Something that lives in water
- Something that flies
- Something that you can eat
- Something that smells good
- Something that smells bad
- Something that is rough
- An animal sound
- Something that is smooth
- Something that is dangerous
- Something that is fuzzy
- A stick as tall as the tallest person in the group
- A big rock (the size of a large watermelon)
- Specific animals, rock formations, plants, etc, especially based on what is being learned at the time

How to Organize your Own Cleanup

Source: Keep America Beautiful

How many times have you passed by a litter-strewn park or graffiti-splashed building and wished it would go away? Perhaps it is the local playground plagued with garbage, or maybe a recycling effort needs a jump-start. Whatever the concern is, a solution can be just around the corner. All it takes is someone to say 'enough is enough' and work with their community to eliminate the problem.

Here are few steps to help you and your students get started on your own Cleanup.

1. **All Aboard the Cleanup Cause.** Organize a cleanup committee by seeking out students in the school who are interested in environmental causes. Set a meeting date and let the ideas flow. Decide which project everyone wants to tackle, and assign specific responsibilities to people to let the project go smoothly. This can be a startup of an environmental club for the school.
2. **We are Talking Trash, Transporting and Recycling.** Contact your local Sanitation or Environmental Inspector. They can advise you and the students on the special trash bags, receptacles you may need, information on pick up times and any other useful information or special requirements.
3. **Beauty and the Business.** Turn to local businesses owners to support your and the students efforts. Ask them to donate supplies and provide window space for poster announcing the program. Businesses can rally their own employees to help in the activities.
4. **Enlist the Tall and the Small.** Reach out to local environmental groups, non-profit organizations, church groups, school clubs and other community organizations; ask them to roll up their sleeves and get involved. Also, contact local radio, newspaper and television stations. Alert them about the big cleanup and about what the club plans to do to the town.
5. **Clean your Slate for a Big Cleanup.** Set dates for the activities the club plans. Saturday morning from 8am to noon is usually best, with an alternate rain date the following weekend. Make sure the activity that the club plans is not the same day as another community event, especially one that relies on volunteers.
6. **Check Your To Do List.** Have students make a checklist of the equipment that they need to remove litter, clean up and beautify an area. Ask volunteers to bring some of their own equipment and encourage everyone to wear sunscreen, proper clothing, sturdy shoes and heavy work gloves.
7. **Could Not Have Done it Without You!** Celebrate the achievements and have the students say Thank You to the volunteers for an important job well done. Host a picnic after activities are complete and include local officials, business owners, community and civic groups that helped create the big clean up. Remember to recognize all of their contributions through media and personal communications.

The possibilities are endless – the choice to make a difference is within your students. So roll up your sleeves and have fun with the students. Your efforts to improve the community will become a source of pride for everyone especially the students who helped with the efforts.

Alternate Environmental Activities

These activities can be made into school-wide events that all students can participate in. The activities mentioned below are good activities to have throughout the school year to celebrate environmental events. Many of the activities are also good to help the school participate in becoming or attaining membership of the Eco-school system in Romania.

1. **Environmental Club:** get a group of students who are interested in helping with the environment, help plan environmental activities with the community or with just students and teachers at the school, create school clean ups, set up a school wide recycle program, host environmental field trips, sponsor environmental discussions with guest speakers, can work in collaboration with an environmental NGO to get information and to set up other projects.
2. **Hold a school wide environmental contest:** Organize a poster, essay, poetry, T-shirt design, photography or art contest with an environmental theme. All students are welcome to apply and the works of art can be hung throughout the school for everyone to enjoy. Prizes can be awarded to the winners. A specific environmental theme can be applied to the contest.
3. **Environmental exhibitions:** Each class can plan an environmental exhibit that can be displayed for the whole school to gain information. Each class can work on different environmental themes and all the students of the class can contribute to this idea. Displays can also be placed throughout the community to educate the town, such as the local library, museum and mayor's office. A contest throughout the school can be an incentive for the classes to participate.
4. **Plant trees:** Trees can be donated from the local environmental agency and can be planted throughout the school grounds. Students and teachers can plant the various plants on environmental holidays or on specific school days to celebrate an event. Little signs can be made and placed in front of the tree to commemorate the event. School gardens can also be made and can be sponsored or dedicated to a person
5. **Create a Community Green Map:** The school can design a map of Satu Mare that can be placed throughout the town for tourists and/or residents to know where the green areas are of the town. The green areas are local parks, gardens and/or where people can enjoy nature. The community map can display the name of the high school and the participants who designed the map. The maps can also be placed in parks to show people what the park has to offer. A school map can be created for the school grounds, where visitors, students, teachers and community members know what kinds of green areas that the school has to offer.
6. **Adopt a local tree, river or park area:** Local ecological schools can adopt a tree, a river or a park. The school is responsible for the area and the cleanup of the area. A sign can be placed near the site for people to know who is responsible for the area and who is making sure the area is cleaned. The idea is to have students take pride in their surroundings and to foster the desire to clean the area that is associated with their school. Trees, gardens, park benches can be placed all along the schoolyard to beautify the school and for students to have more enjoyment of their school.
7. **Create an environmental school logo and place it on plastic bags:** Have students create logos for the school about the environment. Develop a contest to decide which design to use. Place the winning logo on plastic bags for the students to use or sell the plastic bags to the community. Reusing of plastic bags is part of recycling and can show others to reuse plastic them instead of throwing them away.
8. **Environmental Time Capsule:** To have students make a time capsule about the environmental efforts and problems that people face today. Place the capsule on the school grounds to be buried for twenty-five years. The time capsule can show the students of

tomorrow what kinds of things were important to the students of today. Each class can pick one thing that they would like to put into the capsule and a class picture too. Students can place other things that are part of the culture today.

9. **Environmental Assemblies:** Students come and participate in a large discussion with community members who work in the various sectors of the environment. Both the school and the community members can come up with a project idea for the environment for the community or for the school. A chance for students to ask questions about the different types of things that people do for the environment in the community.
10. **Environmental Debate:** A school wide debate on various issues the community faces with the environment. The school can form a debate team and debate with other schools or classes can debate with each other. Can be a yearlong event and all the classes can witness the debate and vote on the winner.
11. **Environmental Field Day:** All the students can participate in an all-day or half day event that involves field events dealing with the environment. Event races can deal with recyclable products, critical thinking and leadership skills. Activities can range depending on the age group. Students can also have building competitions with distinct rules to challenge their thinking abilities. The list of possibilities of activities is endless. Host an Environmental Silly Olympiad which is similar but the events are much crazier and involve students getting dirty or wet.
12. **Project Clean Up:** Every month, a school-wide clean up can be held on the school grounds. Or each class is assigned a time of month when they are responsible for the cleanup of the schoolyard. Students can see the difference and discuss the before and after affects of a clean up. Students should also take part in litter awareness programs.
13. **Environmental Resource Center:** A small section can be made in the library were books on the environment, animals and other items related to the environment can be placed in an area were students know where to look. Teachers can assign projects for the students to use the related resources.
14. **Environmental Lessons:** One day a month, teachers provide instruction on an aspect of the environment. Depending on the subject taught by the teacher, the teacher may be able to relate their subject to the environment. Example: history teacher can teach about how the environmental aspects have changed since World War II, the language teacher can show how nature is in poetry; literature or students can learn new words about the environment. The list is endless. Teachers can show how the environment is related to all subjects and how important the environment is.
15. **Environmental Earth Fair:** Hold a community festival that can raise local awareness on environmental protection efforts that can be supported with other environmental organizations and the mayor's office too. Event can be held on school grounds if space is limited in the community. Classes can perform small plays for the event on environmental issues that in turn can be performed for the community and a contest can be held for the plays.
16. **Species Parade:** Have students of all ages or just one class dress up as their favorite animal or as an endangered animal. Students can go around the school or the community showing the people their costumes. Have students create posters or signs to show others the importance of protecting animals and how they are important. The signs can express what the students think is relevant. There are many international holidays for specific animals and on that holiday students can dress as that animal. For example, on October 4 which is International Animals Day, have all the students make costumes of all the different types of birds. Students can have a carnival with their species outfits. Invite local newspapers to write an article and take pictures of the event..
17. **Awareness Fair:** Have all the classes present a topic of interest at an awareness fair. Each class picks a topic to educate others about. Topics can range with all the different problems that the environment faces today. Wildlife Issues, Global Warming, Energy Use, Air and Water Pollution are just some small topics of discussion. The class can have discussions, perform plays, and write poetry or any other way they think that can educate others about the

environment. The Awareness Fair can be one day where the students talk to the other classes about their topics to interested students or classes can rotate and go to other classes to talk about their topic and vice versa.

18. **Eco Hallway or Eco Room:** Each class can decorate their room in an ecological way how they see fit. Students can add recycling bins, informational posters with their drawings about the environment throughout the classroom or any other things that they feel could show their classroom as an ecologically friendly classroom. Can be a school-wide contest for students to have another incentive to redesign their classroom.
19. **Brochures on the Environment:** Each class or a group of students can create a brochure on different environmental issues to educate their fellow students, the school and the public. Once the brochures are done students can have it printed in the local newspapers, in the school magazine or in leaflets that environmental agencies can have to give to the community. Some brochures can be on different ways to recycle, litter awareness, or everyday activities that people do that pollute our community. The possibilities are endless.
20. **Environmental Trashcans:** Design trashcans for the schoolyards. Each class can design their own trashcan and put it in various places throughout the school grounds. Trashcans can be placed in classrooms, hallways, lounges, schoolyards or around the community where the school is located. Trashcans can be painted with designs by students or have items glued on them, have the students be as creative as possible with their ideas. Environmental themes can be placed on the trashcans to give information to students, teachers or others about the horrors of not throwing their trash away in the right place. Recycle containers can be designed, to encourage the school, students and the community to recycle.
21. **Address a local or global environmental problem in class:** Have each class decide on an environmental issue to investigate. Then have the class construct research on the problem. Have each class write a group report to report their findings to this class, including any possible solutions identified.
22. **Conduct an Environmental Survey:** How much and what kind of energy, paper, and cleaning supplies are used monthly at your school? How much water is consumed? How much waste, and what type of waste is generated? Identify ways your school can reduce its use of energy and other resources. Have students report their findings to the whole school at an assembly or to classrooms.
23. **Develop an environmental policy for your school:** This is best as a collaborative effort among students, teachers and other staff. Have the principal officially launch the policy on Earth Day or on another environmental holiday.
24. **Imagine the Future:** Have the class write an essay answering the question: 'What might the environment be like on Earth Day 2025?' Create a bulletin board or other types of displays with essays and artwork in the classroom, or at a central location in your school.

Environmental Dictionary

Commensalisms - a relation between two organisms of different species in which one organism benefits, while the other is generally neither helped nor harmed.

Commons - piece of land owned or used by the residents of the community, undivided land used especially for pasture.

Diamante- a poem shaped in the form of a diamond.

Echolocation - a sonar like system as that used by bats, to detect objects by emitting sounds that reflect off the object and return to the source.

Ecologically Sound – ecologically friendly; a design that is created with environmental standards.

Ecosystem - the complex of a community of organisms and its environment functioning as an ecological unit.

Endangered Species - species threatened with extinction, *broadly*: anyone or anything whose continued existence is threatened.

Energy - a source of usable power (as heat or electricity). The capacity to perform work, or the potential for power and activity.

Environment - the external factors and forces and forces surrounding and affecting an organism, person, or population.

Erosion - the group of natural processes, including weathering, dissolution, abrasion, corrosion, and transportation, by which material is worn away from the earth's surface.

Extinct - no longer in existence.

Fossil Fuels – coal, oil, and other energy sources that formed over millions of years from the remains of ancient plants and animals. Fossil fuel use is a major faction in pollution issues.

Global Warming - an increase in the earth's average atmospheric temperature that causes change in climate.

Habitat – an area that provides an animal or plant with adequate food, water, and living space in a suitable arrangement.

Harmful behavior - something someone does that negatively affects the natural environment, i.e. hunting the wildlife or littering.

Litter - trash, wastepaper, or garbage lying scattered about.

Logo - a motto, or in use of environmental standards a preventive message through words.

Mutualism – a symbiotic relationship between organisms of two different species in which both benefit from the association.

Packaging – a bundle of something that is packed and wrapped or boxed; a container in which something is packed.

Parasitism - an intimate association between organisms of two or more kinds, *especially*: one in which a parasite obtains benefits from a host which it usually injures.

Pollution - harmful substances deposited in the air, water, or land, leading to a state of dirtiness, impurity, or unhealthiness.

Predation - a mode of life in which food is primarily obtained by the killing and consuming of animals.

Recycle - to treat or process (used or waste materials) so as to make suitable for reuse, to use again with minimal alteration.

Stakeholder – anyone who or has vested interest and/or a legal role in any given problem (including environmental problems) that requires the cooperation and agreement of many types of people.

Stewardship - the conducting, supervising, or managing of something, *especially*: the careful and responsible management of something entrusted to one's care *Stewardship* of our natural resources.

Ultrasonic - utilizing, produced by, or relating to ultrasonic waves or vibrations.



Material Lists

Common Materials for lessons:

- Chalkboard and Chalk
- Drawing Materials: Markers, crayons, and colored pencils
- Glue
- Resource Materials
- Scissors
- Scrap Paper: regular-size and large, all sizes
- Space for students to spread out
- Tape to hang up students drawings
- Writing Utensils

Other Materials:

- A bucket of water
- A days worth of trash
- Blindfold
- Clean garbage
- Cotton swabs
- Garbage bags, clear plastic bags, all sizes, twist ties to close the bags
- Glass jars
- Gloves or small bags for student's hands
- Graph paper
- Guppies
- Hand lens
- Insect nets (can be made from panty hose and clothes hangers)
- Light source
- Music source that can be turned off and on easily
- Old magazines
- One meter by one meter of grass plot with soil
- Packaging of everyday products
- Paper towels
- Pictures of land formations
- Plant and animal guides
- Plastic cups
- Rocks, soil, and sand
- Rubber bands
- Ruler
- Scale
- Several bowls
- Several Two-liter bottles
- Small bucket
- Two buckets
- Two graduated cylinders
- Two-kilograms of crackers
- Two thermometers
- Two trays
- Wall map
- Water plants
- Water snails
- Water source
- Watering can
-

Helpful Sources for Environmental Education

Braus, Judy and David Wood. **Environmental Education in the Schools: Creating A Program that Works!** Washington, D.C.: Peace Corps ICE, August 1993.

Vagos, Kris. **And the Green Leaves Grew.** Deva, Romania: Retezat National Park Fall 2003.

Internet Sources:

- The Bat Conservation Trust: www.bats.org.uk/
- Earth Day Network: www.earthday.net
- Educators Reference Desk: www.eduref.org
- Environmental Protection Agency: www.epa.gov
- Keep America Beautiful: www.KAB.org
- National Geographic Xpeditions: www.nationalgeographic.com/xpeditions/
- Nature Park: www.naturepark.com
- North American Association for Environmental Education: <http://eelink.net/classroomresources-directories.html>
- Science Net Link: www.sciencenetlinks.com/
- Texas Commission of Environmental Quality: www.tceq.state.tx.us/index.html
- US Geological Society: www.usgs.gov

Other helpful links to environmental lesson plans (in English):

- American Forests: www.americanforests.org/
- Earth 911: Making Every Day Earth Day: www.earth911.org
- Earth Justice Foundation: www.earthjustice.org
- Eokids: www.ecokidsonline.com
- Environmental Defense: www.edf.org
- Environmental Education Directory: <http://enviroeducation.com>
- Environmental News Network: www.enn.com/
- Friends of the Earth: www.foe.org/
- Marco Polo- Internet Content for the classroom: www.marcopolo-education.org/index.aspx
- National Parks and Conservation Association: www.npca.org/
- National Wildlife Federation: www.nwf.org
- Natural Resources Defense Council: www.nrdc.org/
- Online Environmental Community: www.envirolink.org
- Project Learning Tree: www.plt.org
- Regional Environmental Center for Central and Eastern Europe: www.rec.org
- Skewl Sites: www.skewlsites.com/ethsp.htm
- Treeture Treasures: www.treetures.com
- United Nations Environment Program: www.unep.org/
- Worldwide Fund for Nature: www.panda.org
- Wildlife Conservation Society: <http://wcs.org>
- Wildlife Preservation Trust International: www.wptl.org
- World Resources Institute: www.wri.org
- World Watch Institute: www.worldwatch.org

Model Letter to the Parents

This letter can be used as a model to write to parents that your students will be learning about the environment in the classroom. This letter is good to send to parents if a student needs to gather supplies for certain lessons or leave the campus for an activity.

Dear Parents,

We have the pleasure to invite your children/child to a new program of ecological education. This program is part of a yearlong program throughout Satu Mare County. The program's success will mean its extension to other schools of other age ranges.

The teaching method of this education program will be very different from the traditional method. The notions of ecological education will be presented through games, drawing and writing activities and hands on learning that are used in an interactive and attractive way to the students. These materials are inspired from the models of presentation in the United States. We are convinced that this new method will be useful and amusing as well for your child as well as for the teacher because it offers students the chance to learn many new things in an easy and attractive way.

As every new thing, we are still experimenting with the process and need your help with the evaluation in order to create the perfect variation for all schools in Satu Mare. That is why we will greatly appreciate your interest. Please do not say that you agree or disagree with this project of ecological but provide us with constructive suggestions for improvement for this ecological education project.

Below you will find a list of materials your needs, in order to participate in these activities. If you believe that some of these materials are a problem to obtain, please feel free to contact us.

Besides these materials that are needed for each child, there is the possibility to ask some children to bring in other objects too; if it is easily accessible or that the student already has the mentioned materials readily available.

If you have any questions, please do not hesitate to contact the school or myself. Below you will find the phone numbers to contact me. If you would like to take part in one or more activities for helping, please tell us. We will be very happy to have you among us, in helping your child excel.

Yours Sincerely,

Input Teacher or School Name
Contact Information

Materials that children should bring to school on a specific date:

Index of Lessons

	IV	V	VI	VII	VIII	Indoor	Outdoor	Subject
The Environment- What is it anyway?	X	X	X	X	X	X		Learning about the Environment
Wordbank	X	X	X	X	X	X		Learning about the Environment
Connections	X	X	X	X	X	X		Web of Life
We Can Thank the Environment	X	X	X	X	X	X		Natural Resources
The Great Fish Dilemma	X	X	X	X	X	X		Natural Resources
Harmful Behaviors	X	X	X			X		Environmental Ethics
Environmental Debate	X	X	X	X	X	X		Environmental Ethics
What Would You Do?	X	X	X	X	X	X		Environmental Ethics
We Built This City				X	X	X		Environmental Reasoning
Not Just a Home	X	X	X	X	X	X		Habitat Loss
School Yard Ecosystems	X	X	X	X	X		X	Ecosystems
An Island Home	X	X	X	X	X	X		Ecosystems
Bottle Habitat	X	X	X	X	X	X		Aquatic Ecosystems
Rain Forest Erosion	X	X	X			X		Erosion
Macho Mountain Building	X	X	X	X	X		X	Erosion
Project: Clean Up	X	X	X	X	X		X	Litter
Water Pollution	X	X	X	X	X		X	Water Pollution
Environmental Fair on Recycling	X	X	X	X	X	X		Recycling
Making Paper	X	X	X	X	X	X		Recycling
The Trash We Pass	X	X	X	X	X	X		Recycling
Speak Up for Recycling			X	X	X	X		Recycling
All Wrapped Up	X	X	X	X	X	X		Packaging
If a Tree Falls in the Forest	X	X	X	X	X	X		Forestry
Energy Conservation	X	X	X	X	X	X		Energy
Environmental Issues in the Polar Regions	X	X	X	X	X	X		Polar Regions
Why are Species Endangered?	X	X	X	X	X	X		Endangered Species
Echolocation	X	X	X	X	X	X		Echolocation and Bats
Images of Bats	X	X	X	X	X	X		Myths about Bats
Shades of Meaning	X	X	X	X	X	X		Environmental Art
Environmental Jeopardy	X	X	X	X	X	X		Learning about the Environment

Evaluation of 'Our World is Our Treasure'

Please fill out the evaluation form for one of the lessons you chose to use in your classroom. Please be honest, this evaluation will help make 'Our World is Our Treasure' a better manual for teachers to use in their classrooms.

Lesson Name:

Time

How much time did you need to prepare the lesson?

Was the time allotted for the lesson too short? Too long?

Please make any comments or recommendations you think are necessary concerning the lesson time.

Materials

Were the materials easy to obtain?

If not, were you able to create a successful alternative?

Please explain who provided the materials? The school? You? Students? Parents?

If you provided the materials, did the school repay them?

Please make any comments or suggestions concerning the materials.

Content and Method

Do you think the information transmitted by the lesson was important? Please explain.

Do you think the lesson reached its purpose?

Please give details.

How well was the lesson received by the students?

How did you feel teaching the lesson?

Please make any comments or recommendations that concern the content and methods in this lesson.

Overall

Is the manual easy to read, understandable, and easily applicable for the classroom?

Do you think the manual addresses the key environmental issues that Romanians face today?
Are the topics relevant to teach in the classroom?

Any comments or suggestions to improve 'Our World is Our Treasure'? Every idea is welcomed.

What types of things would you add to this manual to make it more relevant for Romanian teachers?

When you have finished this evaluation form please send it back to:

Societatea Carpatina Ardeleana – Satu Mare

EKE – Satu Mare

Str. Aurel Popp nr. 14

440012 Satu Mare

Romania

eke@xnet.ro

www.eke.ro



Societatea Carpatina Ardeleana – Satu Mare

EKE – Satu Mare

Str. Aurel Popp nr. 14

440012 Satu Mare

Romania

eke@xnet.ro

www.eke.ro